# PHASE I CORRECTIVE ACTION PLAN WORK PLAN

Commissary/PX Study Area
The Presidio of San Francisco
San Francisco, California

Prepared for:

**The Presidio Trust**
34 Graham Street
Post Office Box 29052
San Francisco, California

June 2006

Project No. 9886.000

Geomatrix

June 2, 2006

Mr. Devender Narala
California Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: **Phase 1 Corrective Action Plan Work Plan dated June 2006**
Commissary/PX Study Area
Presidio of San Francisco - San Francisco, California

Dear Mr. Narala:

Via transmittal letter dated April 28, 2006, the Presidio Trust (Trust) provided the Regional Water Quality Control Board (RWQCB) with the document entitled *Phase 1 Corrective Action Plan Work Plan ("CAP Implementation Work Plan") dated April 2006* prepared by Geomatrix Consultants, Inc on behalf of the Trust. The CAP Implementation Workplan provides a detailed description of the field activities and other requirements the Trust will undertake to implement selected corrective action for the Phase 1 area of the Commissary PX Study Area as described in the Revised Final CAP. In response to comments provided by the RWQCB, enclosed for your review and approval is the document entitled *Phase 1 Corrective Action Plan Work Plan dated June 2006.*

Changes from the April 2006 version to the enclosed June 2006 version of the CAP Implementation Work Plan include the following: correcting editorial errors and typos; making edits to the document so it is consistent with edits made in the Revised Final CAP dated May 2006; clarifying that all Geomatrix field staff will be working under the direction of a licensed Civil Engineer; and, adding a new figure to clearly indicate the land use control zone for the subject site.

The Trust has begun the process to procure a remediation contractor for the field activities required by the CAP Implementation Work Plan and our current target date for commencement of on-site activities is the week of June 19th. As you know, we have scheduled a field oversight planning meeting with the RWQCB and other stakeholders. This meeting will be held **on June 6th at 1:30 p.m. at Blg 1750 in the Presidio.** Please contact Jennifer Yata of my staff at (415) 561-4272 with any questions regarding that meeting.

We look forward to working with the RWQCB and all other stakeholders for the successful implementation and completion of the work required at the Commissary PX Study Area Site. We request your approval of the enclosed *Phase 1 Corrective Action Plan Work Plan dated June 2006* at your earliest convenience. Please note that a PDF file of the enclosed document is in

preparation and will be submitted to the RWQCB and other stakeholders in mid-June under a separate cover.

Please do not hesitate to call me at (415) 561-4259 with any questions.

Sincerely,

Craig Cooper
Environmental Remediation Program Manager
THE PRESIDIO TRUST

Enclosure

cc: Brian Ullensvang, NPS
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Prepared for:

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34 Graham Street
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Prepared by:

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2101 Webster Street, 12th Floor
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**CERTIFICATION**

**PHASE 1 CORRECTION ACTION PLAN WORKPLAN**
Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, California

June 2, 2006
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This report was prepared by the staff of Geomatrix Consultants, Inc., under the supervision of the Engineer(s) and/or Geologist(s) whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications, or professional opinions are presented within the limits described by the client, in accordance with generally accepted professional engineering and geologic practice. No warranty is expressed or implied.

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Presidio of San Francisco, California

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# PHASE I CORRECTIVE ACTION PLAN WORK PLAN
Commissary/PX Study Area
Presidio of San Francisco, California

## 1.0 INTRODUCTION

Geomatrix Consultants, Inc. (Geomatrix) has prepared this Correction Action Plan (CAP) Work Plan for the Phase 1 Area (Phase 1 CAP Work Plan) in the Commissary/Post Exchange (PX) Study Area (the Study Area) at the Presidio in San Francisco, California on behalf of the Presidio Trust (Trust). The Phase 1 CAP Work Plan was prepared to document plans for implementation of the corrective action recommended in the *Revised Final Corrective Action Plan for the Commissary/Post Exchange Study Area* (Revised Final CAP, Treadwell & Rollo [T&R], 2006).

As discussed in the Revised Final CAP, corrective action will be implemented in two phases. In the First Phase, soil will be removed from all impacted areas located within Area A (managed by National Park Service [NPS]) and portions of Area B (managed by the Trust) within an approximately 150–foot buffer zone along the Crissy Field Marsh shoreline. A description of the extent of soil excavation and cleanup criteria is provided in Section 2.2. The objective of the corrective action within the Phase 1 Area is to address petroleum-affected soil that potentially poses a threat to Crissy Field Marsh and land uses within Area A. In the Second Phase, remediation will occur within the remainder of the Study Area consistent with anticipated land use, taking into account information about the Crissy Field Marsh expansion that is not currently available. This CAP Work Plan describes the corrective action that will be conducted in the Phase 1 Area. Implementation of the corrective action in the Phase 1 Area is scheduled to begin on June 9, 2006.

## 1.1 BACKGROUND

The Presidio is located at the northern tip of the San Francisco peninsula (Figure 1). It occupies approximately 1,491 acres and is bounded by San Francisco Bay on the north and the Pacific Ocean on the west. Densely populated residential areas of San Francisco border the Presidio to the south and east. The Presidio was a U.S. Army (Army) installation from 1848 through 1994, serving as a mobilization and embarkation point during several overseas conflicts, a medical debarkation center, and a coastal defense for the San Francisco Bay area. Industrial operations formerly performed at the Presidio are associated with maintenance and

repair of vehicles, aircraft, and base facilities. The Presidio also contains a number of landfills used by the Army for the disposal of municipal waste and construction debris.

The Study Area is situated at the northern end of the Presidio, between Mason Street and Doyle Drive (U.S. Highway 101; Figure 2A). Prior to the development of the Commissary and PX, the Study Area housed a number of Army structures, which no longer exist, as part of the Motor Pool. Reviews of historical records, aerial photographs, interviews, and site reconnaissance have identified approximately 30 structures that were present in the Study Area. These structures were used at various times to store supplies, equipment, and fuels to service and maintain vehicles for the Presidio. Additionally, numerous underground storage tanks (USTs) and above ground storage tanks (ASTs), fuel dispensers, and associated conveyance pipelines were reported active at various times between 1900 and 1984 (IT Corporation [IT], 1998). The Motor Pool was demolished in 1984.

Historical activities in the Study Area have resulted in petroleum hydrocarbon releases that were characterized in the Site Investigation (SI) and documented in the SI Report (T&R, 2003). In addition to the identified petroleum releases, four Study Area sites were associated with releases of hazardous substances as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Planned remedial actions for these four CERCLA sites have been documented in a Draft Remedial Action Plan (MACTEC, 2004) and remediation for CERCLA sites in the Phase 1 Area will be addressed independently from the actions described in this Phase 1 CAP Work Plan. Identified petroleum and CERCLA impacts are shown on Figure 2A. During implementation of the Phase 1 remedy, if it is determined that contamination from the Phase 1 Area extends into the CERCLA sites (based on soil confirmation/verification sampling), the excavation activities will generally stop within the site boundary, except where crossing over the boundary limits is necessary to remove significant petroleum contamination that poses a risk to land uses and the Crissy Field Marsh within the Phase 1 Area. Any contamination extending into the CERCLA sites would then be considered during finalization of remedial action selection in the final remedial action plan for the CERCLA sites. These further excavation decisions will be made in consultation with the RWQCB and NPS.

Several past corrective actions have been conducted in the Study Area to address various petroleum hydrocarbon releases, including:

- Building 626 waste oil UST removal;
- Building 603 UST removal;
- FDS-1 UST (Building 617) removal;
- FDS pipeline to FDS-1 removal (pipeline BR6-5);
- Contingency Site 171199-1100 and the Commissary Seeps Interim Source Removal Action;
- FDS pipelines CF-3, CF-4, and CF-12; and
- Contingency Site 111098-1100.

Results from these previous corrective actions are summarized in the Revised Final CAP.

## 1.2 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) for the Study Area were developed in the Revised Final CAP and are as follows:

- Protection of human health and the environment, including Crissy Field Marsh, consistent with future planned land use.
- Cost-effective cleanup of petroleum releases in the Study Area consistent with planned land use.
- Recycling excavated materials such as concrete and asphalt to the extent practicable.
- Compliance with State and Federal environmental laws.
- Consistency of the selected remedial alternatives at the Study Area with the overall transformation of the Presidio into a national park site.
- Preference for permanent ("clean closure") remedies whenever practicable, cost-effective, and consistent with current or anticipated land use.

## 1.3 CLEANUP LEVELS AND CHEMICALS OF CONCERN

This section summarizes applicable cleanup levels for chemicals detected in soil and groundwater. Chemicals that exceed cleanup levels were retained as chemicals of concern (COCs) in the Revised Final CAP.

### 1.3.1 Soil Cleanup Levels and Chemicals of Concern

In the Revised Final CAP, applicable cleanup levels for constituents detected in soil were identified and include cleanup levels protective of human health for both residential (considered unrestricted; used in Area A) and recreational (considered restricted; used in Area B) land uses; cleanup levels for the Ecological Buffer Zone, Saltwater Ecological Protection Zone, and groundwater protection at Crissy Field; and metals background concentrations for beach/dune sand. The Saltwater Ecological Protection Zone does not include the western portion of the Study Area (Figure 2A) and, therefore, the Saltwater Ecological Protection Zone cleanup levels do not apply in this area. For each compound, the most stringent of the criteria was selected as the applicable cleanup level for the Study Area as shown in Table 1. In the case of metals, the background concentration for beach/dune sand was selected as the applicable cleanup level if it was higher than the other more stringent cleanup level.

Chemicals in soil that exceed cleanup levels were retained as COCs and include total petroleum hydrocarbons (TPH) quantified as gasoline (TPHg), diesel (TPHd) and fuel oil (TPHfo), benzene, the following six polycyclic aromatic hydrocarbons (PAHs): benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, and the following six metals: cadmium, chromium, copper, lead, nickel, and zinc.

Although PAHs are a component of petroleum hydrocarbon fuels, they also could be derived from other anthropogenic sources such as asphalt pavement, contaminated fill, particulates from burning, and vehicle exhaust (Agency for Toxic Substances and Disease Registry, 1995; see website at http://www.atsdr.cdc.gov/toxprofiles/tp69.html). All of these non-petroleum sources could have affected soil at the Study Area. Although PAHs in the Study Area may not be associated with petroleum releases in all cases, they were retained as COCs.

Although the SI concluded that elevated metal concentrations were not associated with Motor Pool releases but are associated with the shallow fill material present beneath the Study Area,

potential risk associated with these metals must be managed. Therefore, cadmium, chromium, copper, lead, nickel, and zinc also were retained as soil COCs for the Study Area.

### 1.3.2 Groundwater Cleanup Levels and Chemicals of Concern

In the Revised Final CAP, applicable cleanup levels for constituents detected in groundwater were identified and include cleanup levels protective of groundwater as a potential source of drinking water and the Crissy Field tidal marsh. The most stringent of these two criteria was selected as the cleanup level for the Study Area.

Only arsenic was retained as a COC for groundwater. Dissolved arsenic above the drinking water cleanup level of 10 micrograms per liter (µg/L) has been detected in the vicinity of the Seeps Interim Source Removal Area (samples from seeps 610SP01 and 610SP02 and monitoring wells 610GW102 and 610GW103; Figure 2A).[1] Elevated dissolved arsenic concentrations in this area likely are the result of reducing conditions created by a former petroleum release. None of the dissolved arsenic concentrations exceed the Salt Water Ecological cleanup level of 36µg/L, and therefore, dissolved arsenic concentrations are not high enough to adversely affect Crissy Field Marsh. As acknowledged in the Regional Board Order, it is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh will be used for drinking water purposes. Nevertheless, arsenic has been retained as a groundwater COC and is addressed in this Phase 1 CAP Work Plan.

## 2.0 CORRECTIVE ACTION

The corrective action recommended in the Revised Final CAP is summarized below. As described in the Revised Final CAP, the corrective action will be implemented in two phases. The reasons for using a two-phased approach is described in Section 2.1 and the corrective actions for soil and groundwater are described in Sections 2.2 and 2.3, respectively.

## 2.1 PHASE ONE AND PHASE TWO IMPLEMENTATION

A number of uncertainties make it difficult to accurately define the full extent of contamination or level of effort required to perform corrective action. A phased approach will allow uncertainties to be addressed as better information about future land use becomes available. In particular, information about the potential Crissy Field Marsh expansion project is essential for

[1] Arsenic also was detected at 17 µg/L in one grab groundwater sample near the Former Railroad Tracks/Coal Bin area (600RRGG02).

planning the extent of necessary cleanup. The areas included in the First and Second Phase are shown on Figure 2A.

In the First Phase (Phase 1), soil will be removed from all portions of the Study Area within Area A and portions of Area B located within approximately 150 feet of the present boundaries of Crissy Field Marsh shoreline (i.e., TPHg Source Area, the northern portion of Building 626 RU, and Fuel Distribution System (FDS) Pipeline Residuals Areas 1, 2 and 3 with AST 634 Area). A description of the extent of soil excavation and cleanup criteria is provided in Section 2.2. The objective of Phase 1 soil removal is to address petroleum-contaminated areas that potentially pose a threat to Crissy Field Marsh and land uses within Area A. The Order used a 150-foot buffer along the Crissy Field shoreline when establishing the Saltwater Ecological Protection Zone. Additionally, an evaluation of potential petroleum impacts to the marsh using a dilution attenuation factor assessment (T&R, 2002) indicated that the 150-foot buffer should protect Crissy Field Marsh from petroleum impacts outside the buffer. Therefore, giving first priority to impacted soil within 150 feet of the Crissy Field Marsh is consistent with the goals of the Order.

In the Second Phase (Phase 2), remediation will occur within the remainder of the Study Area. Phase 2 will commence following decisions regarding the potential expansion of the Crissy Field Marsh into the Phase 2 Area. During Phase 2, soil will be removed from RUs located within the Phase 2 Area consistent with land use decisions, subject to RWQCB approval. If the Crissy Field Marsh is expanded into the area, cleanup will be conducted to protect the marsh and human land use, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup may be conducted to protect the anticipated land use (i.e., recreational use). These cleanup decisions will be made in consultation with the RWQCB prior to implementation of Phase 2. The Trust will proceed with Phase 2 work no later than the end of 2008. The uncertainties that warrant conducting the corrective action work in two phases include:

- ***Uncertainties about Crissy Field Marsh Expansion.*** Along Crissy Field, the RWQCB Order specifies separate zones with different cleanup levels. The majority of the Commissary/PX Study Area is in the Order's Saltwater Ecological Protection Zone (Figure 2A). The Zone was drawn to allow for the potential expansion of the Crissy Field Marsh into the Commissary/PX Area. However, the extent and location of potential expansion is currently unknown but is being considered by the Trust and NPS. The proposed expansion project will be evaluated in an upcoming National Environmental Policy Act (NEPA) process. Although it is possible that the Crissy Field Marsh could be expanded to include the Commissary/PX Area, it is likely that alternate

locations for expansion will be selected. Therefore, cleanup of the Phase 2 Area to the most stringent levels required to support an ecologically sensitive marsh is unwarranted until the proposed marsh expansion project is studied under NEPA and a decision is made regarding expansion in to the Phase 2 Area. If instead, the future use of the Phase 2 Area involves a land use other than marsh expansion, then alternative cleanup levels, consistent with actual land use, may be more appropriate. The Saltwater Ecological Protection Zone cleanup levels are considerably more stringent than other potentially applicable cleanup levels (i.e., protection of human health, Table 1 of the Order; protection of terrestrial receptors, Table 2 of the Order; and protection of groundwater in Crissy Field Groundwater Area, Table 5 of the Order).[2] Therefore, remediation costs to remove all soil exceeding the Saltwater Ecological Protection Zone cleanup levels within the Phase 2 Area would be considerably higher than costs of cleanup assuming an alternate land use. Because of these considerable costs, it is prudent to defer cleanup of affected soil within the Phase 2 Area until a decision is made regarding expansion of the Crissy Field Marsh. If the Crissy Field Marsh later expands into the corrective action site, petroleum-affected soil in the Phase 2 Area could be removed at the time of marsh expansion. This phased approach to remediation avoids "double excavation" of soil, once now and again later, thus unnecessarily duplicating mobilization and administrative costs.

- ***Uncertainties about Total Volume of Affected Soil and Associated Remediation Costs.*** The actual extent of affected soil is uncertain and could be very large. Accordingly, remediation costs could be very high. Therefore, it is prudent to defer the cleanup decision until Phase 2 when future land use determinations have been made about the Crissy Field Marsh expansion.

- ***Uncertainties about Archaeological Issues.*** Portions of the Study Area are known to be archaeologically sensitive. Subsurface excavations and activities within the Study Area could disturb or damage sensitive artifacts. The Trust is currently working with Presidio archaeologists to develop an approach for monitoring and processing archaeological artifacts to avoid adverse impacts on the artifacts (See Section 3.4.4). Implementation of Phase 1 will provide an opportunity to evaluate this approach before commencing subsurface excavations within the Phase 2 Area. Because such archaeological monitoring and processing may be time consuming and costly, phasing the work and controlling the total amount of soil to be excavated in a given year should minimize the potential construction delays such monitoring and processing may cause.

[2] The Commissary/PX Study Area also falls within the area designated as an "Ecological Buffer Zone" in the Cleanup Levels Document (EKI, 2002; Figure 7-2). However, these cleanup levels are not applicable to the petroleum-related COCs at this site (TPH, BTEX, and PAHs) because no TPH or BTEX cleanup levels were developed for the "Ecological Buffer Zone" (Table 7-2) and the applicable PAH cleanup levels developed under the Order are considerably lower than those developed for the "Ecological Buffer Zone." For metals, Ecological Buffer Zone cleanup levels are considered (along with all other applicable cleanup levels) because there are no cleanup levels for these contaminants under the RWQCB Order.

## 2.2 SOIL

The elements of the approved corrective action for soil in the Phase 1 Area include the following:

- ***Removal and off-site disposal of petroleum-affected soil.*** Petroleum-affected soil will be removed and disposed of off-site at an approved disposal facility. Excavation will continue until soil confirmation sampling results indicate that cleanup levels are met. In Area A, the Trust will remediate TPH and BTEX contamination to achieve the effective cleanup levels. The Trust will also remediate known areas with PAHs and metals above effective cleanup levels to achieve unrestricted human land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy. If contamination is left in-place above cleanup levels for unrestricted use in Area A, a land use control (LUC) for the area may need to be adopted and would be subject to management of the LUC by the NPS. In Area B, remedial decisions will be based solely on TPH and BTEX (FDS Residuals Areas only) confirmation sample results because PAHs may not be related to petroleum hydrocarbon fuels. PAH cleanup level exceedances in Area B will be evaluated in consultation with the RWQCB during implementation of the remedy. PAHs above cleanup levels will not be removed below asphalt pavement and buildings (both of which serve as a cap) within Area B. See Section 3.4 for a more detailed discussion about soil excavation and cleanup criteria.

- ***Contingency application of oxygen release compound.*** In the event that removal of petroleum contamination is impractical, oxygen release compound (ORC) will be introduced into the excavation area to remediate remaining petroleum contamination. The contingent application of ORC is discussed in Section 3.4.6.

- ***Land Use Controls.*** LUCs will be used in Area B to protect potential receptors from non-petroleum-fuel related PAHs and metals that will not be removed but are present in fill material at the Study Area. LUCs will be in place at the Phase 2 Area (including Building 610) until remediation is complete. LUCs are discussed in Section 4.0.

## 2.3 GROUNDWATER

The recommended alternative includes surface water and groundwater monitoring for arsenic and TPH in the vicinity of the Commissary Seeps Interim Source Removal Area, where arsenic has been detected above the drinking water cleanup level. As discussed in the Revised Final CAP, elevated dissolved arsenic concentrations in the Seeps Interim Source Removal Area likely are the result of reducing conditions created by a former petroleum release. The relationship between reducing conditions in groundwater and elevated dissolved arsenic concentrations is widely recognized (Dragun, 1988, Fetter, 1993, Saxena, et al., 2004, and Kirk, et al., 2004). Reducing conditions can mobilize naturally-occurring arsenic that is present in

soil. Arsenic is mobilized by reductive dissolution of iron and manganese oxides/hydroxides on which it adsorbs (i.e., reduction of iron III to iron II and reduction of manganese IV to manganese II) and the reduction of arsenic from arsenate (arsenic V) to arsenite (arsenic III). Arsenate is more adsorptive on iron and manganese oxides/hydroxides than arsenite.

The Trust is currently in the process of conducting a study to further evaluate arsenic in groundwater and its relationship to petroleum hydrocarbons, soil types, and groundwater chemistry at the Commissary/PX Area and two neighboring CAP sites, Building 1065 Area and Building 207/231 Area. The results of this study will be published in the *Technical Memorandum, Arsenic and Other Metals in Groundwater at Three Corrective Action Plan Sites, Presidio of San Francisco* (MACTEC, 2006 [pending]). Preliminary findings of this study are:

- Reducing conditions are present in shallow groundwater at the Commissary/PX Area;
- Petroleum releases appear to be the main factor that creates reducing conditions favorable to dissolving arsenic from iron-oxide soil coatings into groundwater;
- Once the arsenic dissolves into groundwater, arsenic concentrations remain relatively stable over time; and
- When the petroleum source and reducing conditions abate, arsenic concentrations may tend to slowly decrease due to dilution, dispersion, and transport.

Surface water and groundwater monitoring will be conducted to assess whether the expected changes in groundwater conditions are likely to occur. A LUC will be used to restrict use of this groundwater as a drinking water supply until constituent concentrations are below drinking water cleanup levels. The planned surface water and groundwater monitoring program is presented in Section 5.0.

## 3.0 PHASE 1 CORRECTIVE ACTION IMPLEMENTATION FOR SOIL

Implementation of the approved corrective action for soil is described in this section. For the purpose of this discussion Phase 1 excavation and support areas will be referred to as "the Site". Topics include: site management and sequencing; temporary facilities and controls; site preparation; soil excavation; cultural resource monitoring; confirmation soil sampling; soil loading, off-haul and disposal; excavation, backfilling, and grading; site restoration; health and safety monitoring; and project documentation and reporting.

The corrective action will be implemented in conformance with applicable state and federal laws and regulatory requirements identified in Section 5.3 of the Revised Final CAP. Applicable regulations and requirements pertain to the protection of park resources, the definition of hazardous wastes, the handling and transportation of wastes, the control of particulate emissions and pollutants, and other construction-related activities.

The Trust will notify the appropriate regulatory agencies and the NPS a minimum of two weeks prior to the initiation of excavation activities. All review processes will be completed before the excavation work is begun. The Trust and NPS will review relevant aspects of the project in their respective NEPA and National Historic Preservation Act (NHPA) reviews. In the case of the Trust, the NEPA and NHPS processes are combined into a single review commonly referred to as "$N^2$". In the case of the NPS, the NEPA and NHPA processes are separate, and the NHPA review is commonly referred to as "5X".

## 3.1 CONSTRUCTION MANAGEMENT AND SEQUENCING

The sections below describe how excavation activities will be managed and sequenced.

### 3.1.1 Construction Oversight

Geomatrix will provide field staff working under the direction of a licensed Civil Engineer (collectively; Site Engineer) to oversee on-site activities and ensure the work is completed in accordance with contract documents. The Site Engineer also will be responsible for collecting confirmation and waste characterization soil samples. The Site Engineer will communicate directly with the Contractor selected and hired directly by the Trust regarding the need for additional excavation based on confirmation sample results. The Site Engineer will keep the Trust informed on the progress of corrective action activities. The Trust will regularly communicate the status of the project and confirmation sampling results from Area A and Area B to the NPS and other stakeholders by holding weekly meetings to discuss excavation progress and confirmation sampling results. Specific protocols for resampling areas where over-excavation is required are provided in Section 3.4.5. The Site Engineer will complete project documentation as detailed in Section 3.9.

### 3.1.2 Construction Sequencing

Soil will be excavated in an active, commercial parking lot and within Mason Street. Excavation, backfilling, and Site restoration will be completed in phases to minimize impacts to the tenants of Building 610 and the public. Although traffic will be diverted around active

excavation areas, Mason Street will remain open throughout the project (see Section 3.3.2). The Contractor will sequence all construction activities in a manner that will ensure that the corrective action is implemented in an orderly, efficient, and safe manner and in accordance with this Work Plan. The planned work sequence and estimated schedule for major construction milestones are presented on Figure 7.

## 3.2 TEMPORARY FACILITIES AND CONTROLS

The Contractor will provide and maintain the temporary facilities and controls during implementation of the corrective actions as described in the following sections.

### 3.2.1 Soil Staging Facilities

The Contractor will construct and maintain soil staging facilities at the Site for stockpiling excavated material. Proposed locations for the soil staging facilities are shown on Figures 4A and 4B and include an existing asphalt pad located west of Building 610 and existing asphalt parking areas east of Building 610. The soil staging facilities will be constructed with a 10-mil HDPE bottom liner over the existing asphalt with the sides bermed with K-rails. Stockpiled material in the soil staging facilities will be covered with weighted 10-mil polyethylene sheeting during periods when material is not being added or removed.

Containment, storage, and disposal of free liquids and/or stabilization of excavated material in soil staging facilities will be performed, if required, so that the material is acceptable (i.e., no free liquids) for receipt by off-site disposal facilities. Materials used to stabilize the soil, if necessary, may include Portland cement or fly ash. Water collected in soil staging areas will be collected, treated, and discharged along with water pumped directly from the excavation as described in Appendix C.

### 3.2.2 Equipment Decontamination Facility

The Contractor will establish decontamination areas in which dust, debris, and soil will be removed from equipment prior to leaving the Site. Decontamination methods will likely consist of brushing, vacuuming, and utilizing knock-off plates within or immediately adjacent to excavation areas to remove soil adhering to equipment. Steam cleaning, high-pressure washing, or combinations of the two may also be utilized for soil that cannot be removed using dry decontamination methods. If water is used for decontamination, decontamination will be performed within the equipment staging areas shown on Figure 4A and 4B and the water will

be collected and managed along with excavation dewatering water as described in Section 3.4.3.

### 3.2.3 Personal Hygiene/Decontamination/First Aid Facility

The Contractor will supply and maintain a personal hygiene/decontamination facility and emergency first aid facility at the Site throughout the duration of the corrective action activities. The emergency first aid facility may be located within the personnel hygiene/decontamination facility.

### 3.2.4 Temporary Utilities and Sanitary Facilities

The Contractor will provide temporary utilities such as potable water, electricity, and communication, and will operate these utilities throughout the duration of the corrective action activities. The Contractor also will provide and maintain portable sanitary facilities at the Site throughout the duration of the corrective action activities. Sanitary waste will be removed and disposed at an off-site facility in accordance with applicable laws and regulations.

### 3.2.5 Dust Control

The Contractor will establish an effective means of dust control to minimize the generation of dust associated with excavation activities, truck traffic onto and off the Site, and the effects of ambient wind traversing excavated soil while loading transportation vehicles. Dust control measures may include the following:

- Keeping vehicle speeds on unpaved surfaces below five miles per hour;
- Misting or spraying water while excavating soil and loading transportation vehicles;
- Controlling excavation activities and excavation rates to minimize dust generation;
- Keeping drop heights to a minimum, while loading transportation vehicles; and
- Covering soil stockpiles.

If visible dust is observed, immediate steps will be taken to eliminate it. These steps will include increasing the intensity of dust control activities. If, after increasing dust control activities visible dust is still being generated, excavation or loading activities will be stopped until a plan for further dust control measures is developed.

### 3.2.6 Surface Drainage and Erosion Control

The Trust has prepared a storm water pollution prevention plan (SWPPP) for the project in accordance with regulatory requirements for construction storm water pollution management. A copy of the project SWPPP is provided as Appendix A. The Contractor will implement the best management practices identified in the SWPPP during the project. The Trust will file a Notice of Intent with the State Water Resources Control Board on behalf of the Trust in advance of mobilization. Specific practices that will be implemented to reduce the sediment load of storm water runoff from the Site include grading active work areas to prevent storm water from running from active work areas onto undisturbed areas, installing storm water control devices (i.e., straw wattles and silt fences) around the perimeter of unpaved portions of the Site until vegetation is reestablished, sweeping streets adjacent to work areas on a regular (at least daily) basis, and protecting existing catch basins with silt fences or gravel bags. All straw wattles utilized on the project will be certified as weed and seed free. The Contractor will store fuel and chemicals in such a manner that prevents accidental spills from impacting storm water. On completion of excavation and backfilling operations, the Site will be restored to pre-construction conditions to maintain pre-excavation surface water runoff patterns and quantities.

### 3.2.7 Survey Control

During excavation and grading activities a field grid system will be established by the Site Engineer to help locate key features at the Site. The grid system will be used to locate soil samples, final excavation limits, encountered solid waste, and other pertinent features. In addition to the field grid system, a licensed surveyor will be retained by the Trust to assist in the accurate locating of final confirmation soil sample locations.

The Contractor will conduct a pre-construction topographic survey covering the areas within 100 feet of the initial excavation extents. The pre-construction survey will identify site features including, but not limited to roads, paths, curbs, gutters, drainage features, hydrants, trees, and fences. Upon completion of excavation, the Contractor will survey the horizontal locations and elevations of the final excavation limits and final confirmation sampling locations and obtain elevations within the excavation generally on a 25 by 25 foot grid. However, additional elevations will be obtained to achieve finer resolution, where necessary. Survey data for the final excavation limits will be utilized to estimate the total volume of excavated soil in bank cubic yards. Upon completion of backfilling and site restoration, the Contractor will resurvey the same area as the pre-construction survey to confirm final grades.

Prior to surveying within the boundaries of the Crissy Field Marsh, surveyors will meet with native plant specialists from the Presidio (Plant Specialists). The Plant Specialists will brief the surveyors regarding identification of sensitive plant species and will develop procedures for preventing damage to sensitive plant species during surveying work.

All surveying will be performed by a State of California Licensed Surveyor. Locations will be surveyed to within 0.1 foot relative to the North American Datum of 1927 (NAD27), California State Coordinate System, Zone 3. Elevations will be surveyed to within 0.01 foot relative to the 1907 Presidio Lower Low Water (PLLW) datum and relative to the 1988 North American Vertical Datum (NAVD88). The results of the surveying will be shown on project maps in the Phase 1 CAP Implementation Report.

## 3.3 SITE PREPARATION

Various site preparation activities are described below, including designation of work areas, relocation of Mason Street, identification and relocation of utilities, destruction of a monitoring well, and site clearing and pavement removal.

### 3.3.1 Work Areas

Careful control of project activities will be performed to minimize inconvenience to the public and damage to existing National Park facilities, plants, and wildlife. The excavation areas, stockpile areas, and support areas will be fenced and marked to prevent unauthorized access. The fencing will consist of temporary chain-link fencing equipped with wind-screens and secured with sand bags. The planned locations of excavation, soil stockpiling, and support areas are depicted on Figures 4A and 4B. Where necessary, the Mason Street bicycle and pedestrian path will be rerouted to safely accommodate the public, as described in Appendix B. Signs explaining the work will be developed and posted at the Site to inform the public of the potential presence of hazardous equipment and materials on the Site and in storage or staging areas. The Contractor will provide appropriate warning and other signs commonly used in conjunction with construction activities, while signs of an informational nature will be provided by the Trust. Public access restrictions (e.g., trail and/or road rerouting) are described in Appendix B.

Hauling and transfer operations will be supervised to prevent truck traffic in unauthorized areas. Permissible traffic routes are shown on Figures 5 and 6. Traffic control procedures will be implemented in accordance with the plan outlined in Appendix B. Flaggers, cones, signs,

and barricades will be used, as needed, to warn of trucks entering and exiting the work areas and to direct pedestrian, bicycle, and vehicular traffic away from moving equipment. Trucks will only be allowed to enter the Presidio through the Golden Gate Bridge Toll Plaza, 19th Avenue/State Highway 1, Gorgas Gate, and the Richardson Slip Ramp. Trucks will only be allowed to exit the Presidio via the Golden Gate Bridge Toll Plaza, 19th Avenue/State Highway 1, the Gorgas Gate, and the Marina Gate. If field conditions necessitate, these routes may be changed in consultation with the Stakeholders.

The Contractor will minimize areas where heavy equipment and truck traffic travel on Crissy Field. Any damage to vegetation and soils within Crissy Field will be restored as described in Section 3.7.

### 3.3.2 Mason Street Relocation

As indicted on Figures 3A and 3B, impacted soil is located in several areas within the footprint of Mason Street and the associated bicycle and pedestrian pathway. During soil excavation work in these areas, vehicle and pedestrian traffic will be rerouted around the work area. The excavation work will be sequenced to allow traffic flow to continue during the work. A traffic control plan for the project is provided in Appendix B. The excavations will be backfilled as described in Section 3.6. Restoration of pavements within Mason Street and the associated bicycle and pedestrian pathway is discussed in Section 3.7.

### 3.3.3 Utilities and Permitting

Prior to the start of field activities, Underground Services Alert will be notified by the Trust Utilities Department to locate utilities in the immediate vicinity of the proposed work. The Trust Utilities Department has identified several underground utilities at the Site using existing Army and Trust utility line drawings including a major fiber optics line owned by AT&T. The Trust will coordinate identification and marking of these utilities in the field prior to beginning excavation work. A private utility locating firm will be retained by the Site Engineer to further identify and mark underground utility locations in the vicinity of planned drilling locations.

Existing underground utilities will be protected (e.g., supported in place by the Contractor) during the excavation work. All intrusive activities, such as excavation, will be conducted under a Trust excavation permit.

### 3.3.4 Monitoring Well Destruction

One existing monitoring well located within the planned excavation boundaries will be destroyed as part of the proposed remedial action. Monitoring well 600GW101 is located in the TPHg Source Area (see Figure 2A) and will be destroyed by removing the well box and overdrilling to remove the PVC casing and annular materials in accordance with State of California Water Well Standards and DPH requirements. The overdrilling boreholes will be abandoned by placing neat bentonite grout from total depth to ground surface using a tremie pipe. Well destruction will occur after waste stockpiling areas have been constructed and before the well destruction activities would interfere with the excavation work. Drilling cuttings will be managed and disposed along with excavated soil as described in Section 3.5.

As shown on Figure 3A, several existing monitoring wells are present near planned excavation areas within Crissy Field. The Trust will protect existing monitoring wells that are outside the extent of the excavations. If the extent of soil excavations extend beyond the location of existing monitoring wells, these monitoring wells will be destroyed as described above.

Destroyed monitoring wells will be reinstalled at the same approximate location following backfill of the excavations. Prior to well destruction and installation activities, the Trust will review planned drilling locations through the Trust drilling permit process. The Trust will contact Underground Service Alert (USA) and a private utility locating firm will be retained by the Site Engineer to further identify and mark underground utility locations in the vicinity of planned drilling locations. The Trust project manager will notify the NPS point of contact and other stakeholders before well destruction and installation activities in Area A.

### 3.3.5 Site Clearing and Pavement Removal

The status of existing vegetation in the work areas will be reviewed during the NEPA process. Existing trees and vegetation in excavation areas will be removed from the Site by the Contractor and recycled or disposed at an appropriate solid waste facility in accordance with applicable regulations. The Trust will perform wildlife nest surveys within 24 hours of vegetation removal to identify measures that will be required to protect nesting birds that are identified in the area. Trees will be cut down and removed from the Site by the Contractor either as whole logs or after being processed into chips. Tree stumps will be left in place for removal during soil excavation. The amount of vegetation removed from the Site will be documented by the Site Engineer, and tonnage will be confirmed with truck tickets. The

Contractor will dispose or recycle the existing vegetation at facilities that have been approved in advance by the Trust.

If excavation extends into the Crissy Field Marsh area, the Trust will consult with the NPS to identify sensitive plants within the work area. Sensitive plants will be transplanted and replaced by a Presidio horticulturist using specifications provided by the NPS.

The Contractor will remove existing asphalt and concrete pavements and curbs within excavation areas and transport the material off-site for recycling in accordance with applicable laws and regulations. The amount of pavement removal will be minimized to the extent practical. The quantity and type of these materials will be documented by the Site Engineer, and tonnage will be confirmed with truck tickets. Asphalt and concrete pavements and curbs will be recycled at facilities that have been approved in advance by the Trust.

## 3.4 EXCAVATION ACTIVITIES

Plans for construction of test trenches, excavation of impacted soil, groundwater dewatering, cultural resource monitoring, confirmation soil sampling, potential application of Oxygen Releasing Compound (ORC®), and contingency actions are outlined below.

### 3.4.1 Construction of Test Trenches

Under the direction of the Site Engineer, the Contractor will complete several exploratory test trenches in key areas where additional excavation, beyond the limits of the "Lesser Impact Scenario", may be needed prior to beginning excavation activities in areas adjacent to the corresponding test trenches. Six planned test trench locations are depicted on Figures 3A and 3B.

Soil removed from the test trenches will be placed in the soil staging area for additional characterization, if needed, and off-site disposal. The Site Engineer will collect and analyze one soil sample using the sampling and analysis procedures outlined for confirmation soil sampling described in Section 3.4.5 to provide additional information regarding the extent of impacted soil above soil cleanup goals. The depth of soil sample collection will be equal to the midpoint of the expected excavation height in the corresponding excavation area. Additional soil samples will be collected if evidence of impacted soil (i.e., stained or odorous soil) is observed by the Site Engineer in the test trench.

The test trenches will remain open until analytical data is obtained from the soil samples collected from the trenches. Open trenches will be surrounded with barricades and temporary chain-link fencing. Data obtained from soil samples collected from the planned test trench locations will be used to refine the initial excavation limits. The initial excavation limits for the TPHg source area may be reduced if COCs are not detected above soil cleanup goals in soil samples collected from test excavations. If COCs are present above soil cleanup goals, additional excavation will be performed to remove impacted soil identified in the test trenches. If COCs are not detected above soil cleanup goals, the test trenches will be backfilled using the procedures outlined in Section 3.6.

As shown on Figure 3B, four test trenches are planned within the existing pedestrian and bicycle path north of Mason Street. The test trenches will be completed after implementation of traffic controls for Mason Street Realignment No. 3 for the TPHg Source Area. Traffic controls for Mason Street Realignment No. 3 are depicted within Appendix B.

### 3.4.2 Excavation of Impacted Soil

Based on existing soil sampling data, initial excavation limits to address impacted soils at the Site are shown on Figures 3A and 3B. These areas are based on the "Lesser Impact Scenario" interpretation presented in the Revised Final CAP.

Excavated soil will be loaded into trucks and transferred to the soil staging facility described in Section 3.2.1. It is anticipated that this project can be accomplished using standard excavation and backfilling equipment.

Once excavations are completed to the initial excavation limits in one or more portions of the excavation areas depicted on Figures 3A and 3B, the Site Engineer will screen soils on the floor and sidewalls with a PID and by visual inspection to estimate if additional excavation is needed. If field screening identifies impacted soil on the excavation floor or sidewalls, the vertical and/or horizontal limits of the excavation will be extended in the corresponding portion of the excavation.

If field screening does not identify impacted soil, the Site Engineer will collect confirmation soil samples for laboratory analysis. Confirmation soil sample collection and analysis, including protocols for over-excavating and re-sampling after initial confirmation sampling results exceed cleanup goals, is discussed further in Section 3.4.5. The vertical and/or

horizontal limits of the excavations will be extended, if necessary, in the areas where confirmation soil sample analytical data indicate that COCs are present above Site soil cleanup levels.

In Area A, the Trust will remediate TPH and BTEX contamination to achieve the effective cleanup levels. The Trust will also remediate known areas with PAHs and metals above effective cleanup levels to achieve unrestricted human land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy. If contamination is left in-place above cleanup levels for unrestricted use in Area A, a LUC for the area may need to be adopted and would be subject to management of the LUC by the NPS.

Within Area B, the Trust will remediate TPH contamination to achieve the applicable TPH cleanup levels. PAHs also will be remediated to achieve the ecological and groundwater protection cleanup levels. However, PAHs above human health cleanup levels will be allowed to remain in-place underneath caps. As indicated in the Revised Final CAP, existing landscaped areas with fill material potentially containing PAHs are not expected to pose a risk to human recreational use of the Phase 1 Area. However, if PAH cleanup level exceedances are encountered in landscaped areas in Area B during implementation of the remedy, they will be evaluated in consultation with the RWQCB. A LUC will be implemented to prohibit unrestricted human land use (including residences, schools, day care facilities, and other sensitive uses) of the property and maintain caps over areas with PAHs exceeding human health cleanup levels. The LUC for Area B portions of the Phase 1 Area is also intended to protect against exposure to metals in fill material. The metals within the Phase 1 Area exceed cleanup levels for ecological buffer zone protection but are below human health cleanup levels. The LUC will establish restrictions on expansion of the marsh from its current location into Area B, which will protect sensitive ecological uses of the area. Metals and PAHs are non-mobile compounds and as such, are not expected to migrate via groundwater movement from Area B into the current location of the marsh.

During implementation of the Phase 1 remedy, if it is determined that contamination from the Phase 1 Area extends into the Phase 2 Area (based on soil confirmation/verification sampling), the excavation activities will generally stop at the Phase 2 Area boundary, except where crossing over the boundary is necessary to remove significant petroleum contamination that

poses a risk to land uses and the Crissy Field Marsh within the Phase 1 Area. These further excavation decisions will be made in consultation with the RWQCB and NPS.

At this time, it is anticipated that excavation activities within the Phase 1 Area (primarily at the TPHg Source Area RU) will not extend into the current limits of the Crissy Field Marsh and associated dune habitat, using the fence as a boundary. The Army previously conducted remedial actions within Fill Site 7 to allow for restoration of the 18-acre tidal marsh. As discussed in the *Crissy Field OU4 Implementation Report* (EKI, 2004), the chemical data representing current soil within the marsh area meet Crissy Field RAP cleanup levels for unrestricted use, including TPH, PAHs, and metals. In addition, soil from Fill Site 7 was mixed with surrounding soil and relocated to other parts of Crissy Field and the area has been regraded and restored as a tidal marsh. If excavation sidewall samples along the border of the marsh area indicate COCs above cleanup levels, excavation activities may proceed into the marsh area, if necessary to address human health or ecological risk posed by the sidewall contamination. However, this decision will be made in consultation with the NPS and RWQCB during implementation of the remedy and with a consideration to minimize destruction, loss of habitat, or adverse impacts to the sensitive marsh area.

### 3.4.3 Groundwater Dewatering

The Contractor will dewater excavations as needed to remove groundwater and/or storm water that enters the excavation areas. This water will be pumped to on-site water storage tanks by the Contractor for testing by the Site Engineer and appropriate disposal. Water collected in on-site soil staging areas will also be managed in this manner. A plan for completing groundwater dewatering at the Site is provided as Appendix C.

### 3.4.4 Cultural Resource Monitoring

As discussed in the Revised Final CAP, the Site is within a Historic Sensitivity Zone due to the potential presence of cultural resources. The Site is in, or adjacent to, an approximate 12-acre area designated as the former 19th Century Quartermaster Depot & Landfill. The cultural resources in this area could be of potential contributive value to the National Historic Landmark (NHL) and potentially eligible for the National Register of Historic Places (Jones & Stokes, 2001). An area just south of the Building 626 Area (see Figure 3A) has been designated as an archaeological sensitive area related to a Native American burial site and cultural relics identified in prior studies (T&R, 2002). As required by the NHPA, if ground-disturbing activities are conducted within a Historic Sensitivity Zone to address environmental

contamination, potential impacts to cultural resources should be avoided if possible, and be mitigated by archaeological monitoring during any excavation activities.

Cultural resource monitoring will be conducted by the Trust. Protocols for management of significant cultural resources discovered during the corrective action activities have been developed by MACTEC Engineering and Consulting, Inc. and are presented as Appendix D. These protocols are consistent with the Programmatic Agreement for the Presidio between the Trust and the State Historic Preservation Officer (for work in Area B) and the Programmatic Agreement for the Presidio between the NPS and the Historic Preservation Officer (for work in Area A). The Trust will be working closely with a Presidio archeologist during excavation of impacted soil to minimize the potential for damaging cultural resources that may be encountered during the work.

Soil excavation will only be performed following coordination with the Trust and NPS historians and archeologists. As required by these protocols, if items of potential archeologically or historically sensitive importance are found or suspected to be present, Trust field personnel will contact the appropriate Trust and NPS cultural resources points of contact immediately. If potential human remains are identified, work in the vicinity of the discovery will cease and the Trust will contact the San Francisco County Coroner's Office (SF Coroner). The SF Coroner will investigate and remove the remains, if appropriate.

### 3.4.5 Confirmation Soil Sampling

After impacted soil has been removed and field screening results do not identify additional impacts (see Section 3.4.2), the exposed soil surface will be sampled by the Site Engineer to demonstrate removal of soil containing chemicals above Site soil cleanup levels. Confirmation soil sampling and analysis procedures are described below.

Confirmation Soil Sampling Frequency:

The base of each excavation will be sampled at a minimum frequency of one sample per excavation and at least one sample per 625 square feet (sf). A 25 by 25 foot sampling grid will be used to guide sample collection of excavation bottom samples. Sidewalls will be sampled at the midpoint of the excavation's height (using best professional judgment for biasing sample location to any visible stained soil layers) every 25 feet of its lateral extent or to obtain at least one sample per excavation sidewall. The actual physical dimensions of the excavation will

determine the number of bottom and sidewall samples collected. At least one bottom and four sidewall samples will be collected from each excavation.

If portions of distribution pipelines are identified during excavation work in FDS Pipeline Residuals Areas 1, 2, or 3, the pipelines will be removed and additional confirmation samples will be collected as follows (IT Corporation, 1999):

- every 100 feet below the pipeline,
- at locations where the pipeline changes direction,
- at intersections with piping laterals, and
- at pipeline endpoints.

Confirmation Soil Sampling Methods:

Confirmation soil samples will be collected in accordance with Presidio Trust Standard Operating Procedures (SOP; Tetra Tech, 2001), specifically SOP No. 001 of the Presidio Quality Assurance Project Plan and Sampling and Analysis Plan (QAPP) (Tetra Tech, 2001). Soil samples will be collected in clean brass, stainless steel, or butyrate sleeves, covered with Teflon® sheets and plastic end caps, and labeled. Liners will be driven into the sidewall or base of each excavation, or into a backhoe bucket containing soil from the target sample location. In accordance with Section 2.3.2 of SOP No. 001, the Trust has selected the methodology described above for collection of soil samples to be analyzed for BTEX in FDS Pipeline Residual Areas 1 and 3. Samples will be stored in an ice-cooled chest for transportation to a state certified analytical laboratory under Geomatrix chain-of-custody. Each ice-cooled chest will maintain a sample temperature of $4^{o}C$ ($\pm 2^{o}C$).

Sample Identification and Labeling:

A sample label will be attached to each sample container. The label will be completed in indelible ink with project name and site number, a unique sample identification number, date and time collected, preservative used (if applicable), initials of the sampler, and analyses required. Confirmation sample identification will be conducted in accordance with the Presidio QAPP (Tetra Tech, 2001). Confirmation samples will be identified as follows:

- Site (Building/Location) number,
  1. TPHg Source Area - 609
  2. Building 626 Area - 626
  3. FDS Pipeline Residuals Area 1 - FDS1
  4. FDS Pipeline Residuals Area 2 - FDS2
  5. FDS Pipeline Residuals Area 3 - FDS3
- Sample Type (EX=excavation, SS=stockpile, TANK=water),
- Sequence number (101, 102, 103,…) for confirmation samples, and
- Depth in feet below ground surface (4.5).

For example, the 3rd excavation confirmation sample, collected at 8 feet bgs from the TPHg Source Area will be labeled as sample 609EX103(8). Prior to commencement of construction, field personnel will contact a Trust Environmental Database Manager to confirm that soil sample identification numbers utilized during the project are unique to the Presidio.

Quality Assurance/Quality Control (QA/QC) Samples:

The following QA/QC samples will be collected:

- ***Equipment Rinsate Samples***. Equipment rinsate blanks will be collected daily by running distilled water over each sampling device used. Per the QAPP, equipment rinsate blank identification will be derived by combining the following: the identification number of the sample collected before the blank, the identifier "RB", and a shortened identification of the sample collected after the blank (i.e. a rinsate blank collected after location FDS1SB101 and before FDS1SB102 would have a designation of FDS1SB101RB02).
- ***Field Duplicate Samples.*** Per the QAPP, field duplicate samples will be collected at a frequency of one for every 10 samples of the same matrix. Field duplicate samples will be labeled DUP plus the date (i.e. DUP111104 would represent a duplicate sample collected on November 11, 2004). If more then one field duplicate is collected on the same date, a suffix (i.e. "-1" or "-2") will be used to maintain unique sample identification numbers.
- ***Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples.*** Per the QAPP, MS/MSD samples will be identified using the primary field sample location identification plus "MS" or "MSD" (i.e. 609SB101MS or 609SB101MSD). One MS/MSD sample will be collected per every 20 samples of the same matrix.

Chain-of-Custody Records:

Chain-of-custody records provide an accurate written record that tracks the possession of individual samples from the time of collection in the field until they are accepted at the laboratory. The chain-of-custody record also will be used to document the samples collected and analysis requested. Field personnel will record the following information on the chain-of-custody record:

- Project name and number;
- Name and signature of sampler;
- Destination of samples (laboratory name);
- Sample identification number;
- Sample location, description, and depth (when applicable);
- Date and time of collection;
- Number and type of containers filled;
- Analysis requested;
- Preservatives used (if applicable);
- Filtering (if applicable);
- Signature of individuals involved in custody transfer (including date and time of transfer);
- Laboratory purchase order number;
- Airbill number (if applicable); and
- Relevant remarks related to sample analysis (such as samples selected for MS/MSD analysis).

Unused lines on the chain-of-custody record will be crossed out and initialed. Chain-of-custody records initiated in the field will be signed by the field personnel and the chain-of-custody record will be taped to the inside of the lid of the shipping container used for sample transport. Copies of the chain-of-custody record will be retained and filed by the field personnel before the samples are shipped. Per QAPP requirements, a copy of the chain-of-custody record will be delivered to the Trust project manager or designee as soon as possible after sampling. Multiple coolers may be sent in one shipment to the laboratory. Each cooler will contain a separate chain-of-custody record of the samples contained within that cooler. The outside of the coolers will be marked to indicate the number of coolers in the shipment.

Sample Shipment:

Sample containers will be placed in zip-closure plastic bags and placed on ice in a cooler for storage and transport to the laboratory for chemical analysis. Chain-of-custody records will be initiated to document sample handling and delivery and will be included in the shipment to a State-certified analytical laboratory. Custody seals will be used on each sample transport container to ensure that no tampering occurs. Custody seals used during the project will consist of security tape with the date and the initials of the sampler or field team leader. Sample transport containers will be sealed with two custody seals, one placed on the front of the container and one placed on the side after the samples are packaged. The tape will be placed such that the seal must be broken to gain access to the contents of the transport container.

Confirmation Soil Sampling Documentation:

Confirmation sample locations will be marked with stakes or flags to identify sample number and location. Confirmation sample locations will be sketched in field notes, with distances from known points to allow relocation. Confirmation sample locations that meet remedial goals will be surveyed along with the limits of the excavation.

For all samples collected at the Site, sample tracking documents will be prepared so that chain-of-custody records can be maintained and sample disposition can be controlled. Forms and labels will be filled out with waterproof ink. Sample identification documents will include a daily field activity log, a sample label, and chain-of-custody records. The Site Engineer will prepare these records during each sampling activity.

Confirmation Soil Sampling Analyses:

All confirmation samples will be analyzed for the following COC constituents:

***For Area A:***

- PAHs by EPA Method 8270C (for TPHg Source Area only);
- BTEX by EPA Method 8260B (for FDS Residuals Areas only);
- TPHg, TPHd and/or TPHfo by EPA Method 8015 modified and EPA Method 3630A - Silica Gel Cleanup; and
- Metals by EPA Method 6010/6020.

***For Area B:***

- PAHs using EPA Method 8270C; and
- TPHg, TPHd, and TPHfo using EPA Method 8015 modified, and EPA Method 3630A-Silica Gel Cleanup.

Data Management:

Geomatrix will obtain analytical data directly from the laboratory and will perform a preliminary review of the chemical data and QA/QC data prior to making decisions in the field regarding over-excavation and backfilling. Geomatrix will present available analytical data from Area A and Area B excavations at weekly meetings with the NPS and other interested stakeholders. A formal QA/QC data review will be performed by an outside firm. The results of the formal QA/QC review will be presented in the CAP Implementation Report.

Overexcavation:

Confirmation soil sample analytical results will be compared to the target effective cleanup levels listed in Table 1 to assess if further excavation is necessary, in accordance with the process described herein. Professional judgment will be used to determine how much additional soil will be over-excavated in the vicinity of the confirmation soil samples showing COCs above cleanup levels. The size of the over-excavation will be based on the type of contaminant, the magnitude of the exceedance relative to the cleanup level, the results of field monitoring (if applicable to the COC), as well as other observations made in the field as to the extent of soil discoloration, soil type, olfactory evidence, extent of debris, etc. Additional excavation will proceed in no less than 1 foot increments. The NPS and RWQCB will be consulted regarding over-excavation decisions.

Confirmation samples will be collected from the over-excavated area at the same frequency as the confirmation soil samples that were collected from the initial excavation. At a minimum, one floor and three perimeter samples will be collected from the over-excavated area. Soil samples collected from the over-excavation will be analyzed for the COC suite associated with the chemical(s) that exceeded cleanup levels in the initial confirmation soil sample.

### 3.4.6 Potential Application of Oxygen Release Compound

The Trust anticipates removing petroleum-impacted soil until confirmation soil sampling results indicate that cleanup levels are met. If necessary, the Trust will utilize *in situ* treatment

to remediate residual petroleum impacts that are beyond the reach of conventional excavation technologies.

If *in situ* treatment is necessary to remediate residual petroleum impacts in a portion of an excavation, the Contractor will create a slurry mixture consisting of ORC Advanced™ solids and water. ORC Advanced™ is an oxygen-releasing compound manufactured by Regenesis Technical Services that is used to stimulate aerobic bioremediation of petroleum impacted soils and groundwater. The Contractor will mix the slurry according to the manufacturer's recommendations. The Contractor will then backfill the saturated portion of the excavation with crushed rock that has been mixed with the ORC Advanced™ slurry at a pre-determined mixing rate. This mixing rate will be developed by Geomatrix based on the magnitude and extent of residual petroleum hydrocarbons and utilizing proprietary software developed by the manufacturer (Regenesis, 2004). The Trust will provide the NPS with background calculations for determining mixing rates to be used and an opportunity to provide input regarding the selected mixing rate. Estimated backfill mixing rates are expected to be between 0.1% and 0.5% ORC Advanced™ by weight. ORC application will not be included in the initial scope of work for the Contractor, but will be added to their scope of work for excavation backfilling, if *in situ* treatment is necessary.

### 3.4.7 Contingency Actions

To minimize disruptions to the work, the following contingency actions have been developed. These situations are not expected to occur. However, it is prudent to plan for their potential occurrence and take reasonable measures in advance in order to be able to implement these actions quickly in the event that they become necessary.

#### *3.4.7.1 Unexploded Ordnance*

It is unlikely that any unexploded ordnance (UXO) will be found within, or in the vicinity of, the Site. However, UXO has been discovered in other unexpected locations within the Presidio. Therefore, construction crews will be advised of this possibility, and guidelines for recognizing UXO will be attached to the project-specific Health and Safety Plan. These guidelines will be consistent with the NPS GGNRA SOP regarding potential UXO discovery procedures (GGNRA, 2004). If UXO is discovered during the course of the work, the Contractor will cease work in the affected area, remove personnel from the affected area, and contact the Trust project manager, who in turn will coordinate a response with Park Dispatch

and all other interested parties. The Contractor will resume work only upon authorization from the Trust project manager.

#### *3.4.7.2 Drums or Other Containers*

In the event that drums or other containers containing liquids are found during the performance of the excavation work, the contents will be sampled and the containers will be handled in accordance with the Site-specific Health and Safety Plan and all applicable laws and regulations. They will be placed in lab-packs, overfill drum, or other suitable containers for transportation and off-site disposal.

Although not anticipated, if the remedial actions involve the removal of previously unknown underground storage tanks (USTs), the Trust will comply with applicable State and local regulations. If encountered, USTs and any associated petroleum hydrocarbon-impacted material would be removed under City and County of San Francisco Department of Public Health and San Francisco Fire Department oversight in accordance with standard procedures at the Presidio.

#### *3.4.7.3 Asbestos-Containing Materials*

The presence of asbestos containing materials (ACMs) is considered unlikely at the Site. In the event that ACMs are found during the performance of the excavation work, they will be handled in accordance with the Site-specific Health and Safety Plan and all applicable laws and regulations, as well as any applicable requirements of the Presidio's Asbestos Operation and Maintenance program (HES, 2000). If native serpentinite is encountered during the excavation, protective measures will also be implemented as specified in the Site-specific Health and Safety Plan.

## 3.5 LOADING, OFF-HAUL, AND DISPOSAL

Impacted soil at the Site is not believed to be hazardous waste. Transport and disposal of non-hazardous waste generated during the corrective action will be performed in accordance with the pertinent sections of Title 27 of the California code of Regulations, which addresses proper management of solid wastes.

If existing analytical data are sufficient for gaining acceptance to an appropriate off-site disposal facility, excavated soil may be loaded directly into transportation vehicles for off-site disposal. If existing analytical data are insufficient for gaining acceptance to an appropriate

off-site disposal facility, the Site Engineer will temporarily stockpile excavated soil on-site and collect composite soil samples from four sub-samples collected at different locations within 500 cubic yard sections of the stockpiled soil. Analytical data from the composite soil samples will be used, along with relevant existing analytical data, to characterize the stockpiled material for off-site disposal.

Once excavated soil has been accepted for disposal at an appropriate off-site disposal facility, the Contractor will load the soil into trucks and transport the material directly to the disposal facility. All wastes will be transported and disposed of in accordance with applicable laws and regulations. All generated wastes will be disposed of at facilities that have been selected in advance by the Trust. All transportation vehicles will be tarped before leaving the Site. The quantity of impacted soil will be documented in the field, and tonnage will be confirmed with truck tickets. Soil disposal will be documented with appropriate manifests or bills of lading.

## 3.6 EXCAVATION BACKFILL AND GRADING

Following Site Engineer approval that the excavation limits have been achieved, the Contractor will backfill the excavations with imported fill materials. The Site Engineer will inspect imported fill sources and collect samples for laboratory analysis to identify the potential presence of chemicals before the fill is brought to the Site. Sample collection and QA/QC procedures will be in accordance with the Presidio QAPP**.** Potential fill material will be sampled at each fill source at a frequency and analytical suite consistent with Department of Toxic Substances Control (DTSC) guidance (DTSC, 2001). For borrow area stockpiles greater than 5,000 cubic yards, this frequency consists of 12 composite samples for the first 5,000 cubic yards and one additional composite sample for each additional 1,000 cubic yards. Samples will be analyzed for volatile organic chemicals (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHg, TPHd, and TPHmo), and Title 22 metals using EPA Test Methods 8260B, 8270C, 8015B, 6010C, plus 7471A for mercury, respectively. If the proposed backfill material is from an agricultural source, samples will also be analyzed for pesticides and herbicides by EPA Methods 8081A, 8141A, and 8151A. Chemical concentrations detected in samples of potential imported fill will be compared to the Site soil cleanup goals and the requirements for backfill material specified in the Order. Soil with chemical concentrations above Site soil cleanup goals and the requirements of the Order will not be accepted for import to the Site. Backfill material for Area A will be reviewed and approved by the NPS prior to placement in Area A.

Prior to placing backfill material, the Contractor will remove groundwater from the excavation using the procedures described in Section 3.4.3. In pavement areas, the Contractor will place aggregate drain rock in the bottom of the excavation to an elevation approximately 2 feet above the observed water level in the excavation. The Contractor will place a layer of non-woven geotextile fabric above the aggregate drain rock. Aggregate drain rock will not be placed in unpaved areas.

The Contractor will use imported fill to backfill the excavation above the geotextile fabric and below pavement or unpaved area subgrade elevations. Backfill material will be placed in loose lifts less than eight inches thick and compacted to at least 90 percent of the maximum dry density as determined by ASTM D 1557 greater than two feet below pavement subgrade elevation. Backfill material placed less than two feet below pavement will be compacted to at least 95 percent of the maximum dry density as determined by ASTM D 1557. In landscape areas, backfill material will be compacted to at least 90 percent of the maximum dry density as determined by ASTM D 1557. The Site Engineer will observe placement and compaction of the backfill material and perform density tests at representative locations to confirm that adequate compaction is obtained.

## 3.7 SITE RESTORATION

Once excavations have been backfilled, the Contractor will construct pavement sections consisting of six-inches of compacted aggregate road base below four-inches of asphalt concrete within Mason Street and the Contractor will place six-inches of compacted aggregate road base below two-inches of asphalt concrete within the Mason street bicycle path and light-use parking and drive areas. The areas where these backfill sections will be utilized are depicted on Figures 4A and 4B. The Contractor also will replace curbs, gutters and utility vaults damaged or removed during the work and restore and re-stripe pavement areas.

The Trust will restore in kind, topsoil and vegetation in unpaved areas affected by the work. Top soil and vegetation affected by excavations or vehicle traffic in unpaved areas within Area A will be restored in accordance with NPS requirements. Prior to commencement of construction, the Trust will obtain NPS-approval of sub-grade soil, topsoil, compaction requirements, and seed mixes utilized to restore affected unpaved areas within Area A.

Construction of temporary pavement areas will be required to construct traffic realignments to facilitate excavation of impacted soil within Mason Street and the associated paved bicycle and pedestrian path. The planned realignments of Mason Street, and associated temporary pavement areas, are described in Appendix B. Areas with temporary pavement will be restored to their pre-excavation condition upon completion of the work. During partial excavations and partial backfill operations that will be required for the TPHg Source Area (see Appendix B), clean backfill material will be separated from residual impacted soil by shoring materials or geotechnical fabric placed in the excavation prior to backfilling.

## 3.8 PROJECT HEALTH AND SAFETY

The following sections describe Health and Safety Plans that will be prepared and monitoring and other work controls that will be implemented to maintain a safe work environment.

### 3.8.1 Health and Safety Plans

Geomatrix will prepare a Site-specific Health and Safety Plan ("H&SP") for use by its employees. The Geomatrix H&SP will be prepared in accordance with Federal and California Occupational Safety and Health Administration ("OSHA") standards for hazardous waste operations (29 CFR 1910.120 and 8 CCR 5192). Geomatrix's H&SP will be reviewed and signed by a Certified Industrial Hygienist.

The Geomatrix H&SP will include the following:

- A description of activities and potential hazards;
- The level of personal protection that will be used during sampling activities;
- Definition of exclusion, contaminant reduction, and support zones; and
- Required personal protective measures, including work zone air monitoring.

The Contractor is responsible for the safety of their employees and will prepare and implement a health and safety plan (H&SP). Copies of both the Geomatrix and Contractor H&SPs will be available on-site at all times. All visitors to the Site will familiarize themselves with these H&SPs and sign in and out when entering or leaving the Site. The Daily Sign In/Out Log will be kept in the Site field trailer or with the construction contractor if a trailer is not used.

### 3.8.2 Monitoring and Work Controls

Monitoring of atmospheric conditions, including dust levels and organic vapors will be addressed in the Site-specific Health and Safety Plans. The Contractor will provide a means of minimizing/controlling dust levels at locations where restricted and/or potentially impacted soils are excavated. The Site Engineer will visually monitor dust levels, and if visible dust is observed, the Site Engineer will instruct the Contractor to reduce the dust levels or stop work.

Construction workers who may be exposed to potentially impacted soils will be required to use personal protective equipment (PPE). Specific PPE requirements will be addressed in H&SPs.

The following work practices will be followed by workers at the Site:

- No eating, drinking, or smoking will be allowed in work areas;
- Field personnel will be instructed to wash their hands prior to eating, drinking or smoking in designated areas outside the work areas; and
- Field personnel will decontaminate PPE and equipment that are exposed to impacted soils.

## 3.9 PROJECT DOCUMENTATION

The sections below describe written and photographic project documentation that will be conducted.

### 3.9.1 Daily Site Log Book

The Site Engineer will maintain a Daily Site Log Book during implementation of the Work Plan activities. The Log Book will include a summary of the following:

- Date;
- Weather conditions at the Site, including any precipitation and wind conditions;
- On-site personnel and visitors to the Site;
- On-site equipment, including the Contractor's equipment that is on-site and being used;
- Description of the corrective action activities including type and volumes of material excavated;
- Volume of material hauled off-site and disposal location of the material;

- Contractor's efforts in reducing dust conditions or activities to manage surface water run-off;
- Details of completed testing or samples collected for laboratory analysis;
- Any unforeseen Site conditions encountered during the Work;
- Air monitoring results and instrument calibration records;
- Health & Safety considerations; and
- Instructions given to the Contractor.

### 3.9.2 Photographic Documentation

The Site Engineer will take photographs to document observations, problems, deficiencies, and/or Work in progress. Photographs will be filed in chronological order in a permanent protective file by the Site Engineer. The Site Engineer will prepare and maintain a comprehensive index of each photograph taken during the project. The photograph index will include the following information:

- Date and time of each photograph;
- Location where the photograph was taken and information regarding the orientation of the view of the photograph;
- Description of the subject matter.

Construction photographs for this project will include, at a minimum, the following:

- Pre-construction photographs;
- Traffic control and Site security;
- Demolition of existing pavements and unpaved areas;
- Excavation of impacted material within each excavation area;
- Dewatering excavation areas;
- Stockpiling of impacted material;
- Any unforeseen Site conditions encountered during construction;

- Backfilling and compaction in each of the excavated areas;
- Grading operations;
- Dust control and storm water control operations;
- Equipment Decontamination;
- Loading trucks with impacted material;
- Confirmation sampling locations; and
- Restored pavement and unpaved areas.

## 4.0 LAND USE CONTROLS

The Presidio is divided into two areas designated as Areas A and B (Figure 1). The NPS retained responsibility for Area A of the Presidio and manages Area A in accordance with the General Management Plan Amendment (GMPA). The Trust manages the leasing, maintenance, rehabilitation, and improvement of the non-coastal portions of the Presidio (Area B) in accordance with the Trust Act, including the general objectives of the GMPA (NPS, 1994), Section 1 of the Golden Gate National Recreation Area Act (Public law 92-589, 86 Stat. 1299, 16 USC 460bb), and the Presidio Trust Management Plan (PTMP) (Presidio Trust, 2002). The Trust assumed responsibility for remediation of both Areas A and B of the Presidio on May 24, 1999 by signing the Presidio Memorandum of Agreement (MOA) and the Area A MOA.

The Study Area is generally located in Area B of the Presidio with a smaller portion in Area A. Existing and planned land uses in Area B are directed by the Trust through its comprehensive land use and management plan, the PTMP (Presidio Trust, 2002). Land use controls for Area B remediation sites include restricting or controlling site uses by administrative procedures such as preparing a site-specific addendum to the Presidio Trust's Land Use Control Master Reference Report (LUCMRR). Trust planning/project proponents and members of the public may review all existing LUCs for the Presidio by reviewing the LUCMRR in the Trust Library. The Trust notifies DTSC and RWQCB of any proposed action that may disrupt the effectiveness of the LUCs, and any proposed action that could alter or eliminate the continued need for LUCs. For the portion of the corrective action sites in Area A, land use controls (if necessary) would be implemented according to NPS Area A requirements.

As discussed in Section 2.2, a primary component of the selected corrective action for the Study Area is implementation and maintenance of a LUC within Area B portions of the site. The LUC is a non-engineering measure designed to (1) limit human and/or ecological exposure to contaminants left in-place in soil above levels considered protective of unrestricted use of the site (including residences, schools, hospitals, and day care centers); (2) restrict use of groundwater as a drinking water supply until constituent concentrations are below drinking water cleanup levels; and (3) require the notification of present and future owners and tenants of the property concerning the potential presence of COCs remaining in soil and/or groundwater at concentrations above risk-based cleanup levels for unrestricted site use, including protection of sensitive ecological receptors. The LUC requirements and restrictions are binding on current and subsequent property owners and remain in effect until they are formally removed or modified.

The LUC for the Commissary/PX Study Area is consistent with land uses specified in the PTMP (Presidio Trust, 2002). The allowable land use for the Commissary/PX Study Area is recreational. Recreational land use, as well as commercial, office, institutional, and cultural land uses, will be allowable under the LUC.

Under the selected corrective action for the Commissary/PX Study Area, a LUC will be adopted for Area B portions of the Study Area (within the Phase 1 and 2 Areas) to protect site uses due to the following elements of the corrective action.

- Phase 2 excavation activities will not commence until a decision is made regarding the future expansion of the Crissy Field Marsh into the Phase 2 Area. The Trust will proceed with Phase 2 construction activities no later than the end of 2008. A LUC will be required for the Phase 2 Area to restrict sensitive human land uses and prohibit removal of existing caps (e.g., pavement and buildings) where concentrations of COCs exceed cleanup levels for unrestricted use. The LUC is also required to prohibit expansion of the saltwater tidal marsh or similar habitat restoration projects into the Phase 2 Area.

- Following corrective action within Area B, PAHs, which are present in fill materials throughout the Study Area and are not mobile COCs, may remain in soil under existing caps (e.g., pavement or buildings) or landscaped areas at concentrations above cleanup levels.

- Metals, which are not associated with Motor Pool releases and are not mobile COCs, are present in fill materials throughout the Study Area and beneath the elevated Doyle

Drive. The metals are present at concentrations above cleanup levels under caps (e.g., pavement or buildings) and landscaped areas.

- Dissolved arsenic has been routinely detected above drinking water cleanup levels in groundwater and/or seep water samples collected in the vicinity of the Commissary seeps.

The LUC for the Area B portions of the Commissary/PX Study Area will fulfill the following goals:

- Prevent inappropriate land use of the property with soil containing residual COCs at concentrations above applicable human health or ecological cleanup levels in soil;
- Prevent use of groundwater as a drinking water supply until constituent concentrations are demonstrated to be below drinking water cleanup levels;
- Provide a means (through the Trust's LUC program) for conveying the use restriction to Trust personnel (including land use decision makers), property managers, tenants, and regulators;
- Provide a framework for long-term monitoring to verify that asphalt, landscaping, and buildings capping contaminated soil are maintained and not removed;
- Provide a mechanism for any subsequent property owners or transferees to assume responsibility for complying with the requirements of the site use restrictions if or when the property is transferred; and
- Require that the DTSC and RWQCB be contacted prior to a change in sensitive land use or in the selected remedy.

The "LUC Zone" at the Commissary/PX Study Area is illustrated on Figure 2B. The LUC Zone will encompass all portions of the Study Area within Area B, in addition to the area underneath Doyle Drive. The LUC is bounded to the north by the foot/bike path which runs along the Crissy Field Marsh on the north side of Mason Street (includes Mason Street); to the east by Halleck Street; to the south by the southern edge of Doyle Drive (includes the area underneath Doyle Drive); and to the west by Building 638 and the western edge of the Building 633 Firing Range backstop.

The LUC Zone includes the following CERCLA sites which are present within the Commissary/PX Study Area boundaries: Former Railroad Tracks Area, Former Coal Storage Bin Area, Building 633 Firing Range, and Former Building 609 Area. The evaluation and

selection of remedial alternatives for these CERCLA sites are documented in a Draft RAP (MACTEC, 2004); the Final RAP is in progress. In the Final RAP, any LUC that is selected as a component of the remedies at the CERCLA sites to address PAHs and metals in fill material will limit expansion of the marsh during Phase 1, similar to the remedy selected in the Final CAP. Although remediation for the CERCLA sites are addressed independently and separately from the actions authorized by the Final CAP, the LUC will be coordinated, implemented, and managed as one LUC Zone for the entire property.

It is also noted that the LUC Zone includes a large portion of the former 19th Century Quartermaster Depot & Landfill (Figure 10 of *Jones & Stokes, 2001*). The remainder of the depot and landfill outside of the LUC Zone defined in the Revised Final CAP has been or will be addressed in separate decision documents.

The LUC will include the following restrictions and requirements:

**Non-Allowable Land Uses** – No sensitive uses (including housing, schools, hospitals, day care facilities, playgrounds, or any other uses involving the regular and constant use by children, the infirm, or the elderly) will be allowable for the site. Regular and constant use is defined as one individual being present outside at the site more than a cumulative annual duration equivalent to 3 hours per day, 150 days per year. As such, recreational and educational uses in which children, the infirm, or the elderly are present outside at the site not exceeding 3 hours, 150 days per year per individual, will be allowable. These restrictions do not apply to indoor uses and activities. General recreational, commercial, office, institutional, and cultural land uses will be allowable as well. No homegrown produce may be grown at the site. Use of the LUC Zone as a saltwater ecological habitat restoration area will be prohibited. Use of groundwater as a drinking water supply will also be prohibited.

**Administrative Controls** – For any project that involves excavation or intrusion into the subsurface within a LUC Zone, a project permit, including excavation clearance and project conditions and mitigations, will be applied for and approved through the Trust's dig permit program as well as NEPA and the NHPA ($N^2$ process) prior to commencement of subsurface disturbance in the LUC Zone. Soil disturbance activities within the LUC Zone will be required to adhere to a Health and Safety Plan that is consistent with applicable health and safety standards. Workers in the area will be required to follow the Health and Safety Plan, have the appropriate level of health and safety training, and use the appropriate level of personal protective equipment specified in the Health and Safety Plan.

**Removal of LUC** – If, in the future, the Trust chooses to remove the LUC, a portion of the LUC Zone, or the entire LUC Zone, and excavates soil at concentrations above cleanup levels, soil sampling will be required to verify that effective cleanup levels have been

achieved. Groundwater monitoring will be required to demonstrate that drinking water cleanup levels have been achieved to remove the LUC restriction on groundwater.

**Management of Excavated Soil/Materials** – All soil excavated from a LUC Zone will be managed and/or disposed in accordance with then applicable federal, state and local laws governing excavation, handling, management, and disposal of the excavated material.

**Imported Fill** – Imported fill used within a LUC Zone will meet the cleanup levels for unrestricted human health land use.

The procedures described below will be followed to ensure that the specified LUC for the Commissary/PX Study Area is adhered to by present and future owners and users of the site:

**Project Permit Process** – In advance of implementation, all Presidio plans and projects must be screened for compliance with NEPA and the $N^2$ process. The Trust or NPS, as applicable, will use its interdisciplinary NEPA/NHPA environmental screening process to notify planning/project proponents of the LUC and require adherence to the restrictions and requirements set forth in this CAP for any plan/project involving the LUC Zone. In addition, for any project involving excavation or subsurface intrusion within the LUC Zone, the Trust must approve an Excavation Clearance Permit (dig permit) to ensure that subsurface utilities (water, gas, sewer, fiber optic) are not damaged. The dig permit process will be used to notify and require adherence by excavation project proponents of the LUC restrictions and requirements.

**LUCs Master Reference Report** – The LUC Zone and the specific restrictions and requirements for the Commissary/PX Study Area will be described in a site-specific addendum to the Trust's LUCMRR. In addition, the site-specific addendum for the Commissary/PX Study Area will be provided in an appendix to the completion report for the Phase 1 corrective action work. The LUCMRR, which includes a master map showing all Presidio-wide LUC Zones and a compilation of Presidio LUCs' requirements and restrictions, is maintained and kept current at the Trust Library. Planning/project proponents and other members of the public may review existing LUCs for the Presidio by reviewing the LUCMRR in the Trust Library.

**LUC Tracking in the Trust's GIS Database** – The Trust will include the LUC Zone for the Commissary/PX Study Area in the GIS database that the Trust is preparing to monitor its LUC sites. This database will be available to Trust staff to facilitate decision making and land use planning for Presidio sites.

**Notification and Annual Monitoring** –The Trust will prepare an annual Presidio LUCs Report to confirm that land uses within the Presidio are consistent with the restrictions and requirements of the specified LUC Zones. The LUC for the Commissary/PX Study Area will be included in this report. The Trust will provide DTSC and RWQCB with a copy of the annual report.

**Transfer of Ownership or Control** – The Trust will notify DTSC and RWQCB of any anticipated transfer of ownership or control of any portion of the LUC Zone. Any transfer of ownership or control of the LUC Zone, in whole or in part, will be handled as outlined in the LUCMRR. The Trust would likely record the LUCMRR with the City and County of San Francisco Recorder's Office and the Federal General Services Agency (GSA) to place subsequent Presidio owners or managers on notice of the existence of the LUC Zones at the Presidio. As part of the administrative transfer of the site, the Trust will notify the subsequent owner or manager of the duty to comply with the LUCs and provide them with a current copy of the LUCMRR.

## 5.0 GROUNDWATER AND SURFACE WATER MONITORING PROGRAM

Groundwater and surface water monitoring will be conducted as part of the selected remedy to effectively demonstrate that the soil remedy is protective of groundwater and Crissy Field Marsh water quality. As noted above in Section 4.0, a component of the remedy is implementation of a LUC for Area B to restrict use of groundwater in the area as a drinking water supply until contaminant concentrations are below drinking water cleanup levels. This section describes the groundwater and surface water monitoring program that will commence following completion of Phase 1 construction activities. The need for additional monitoring following completion of the Phase 2 construction activities will be made in consultation with the RWQCB and NPS during development of the Phase 2 CAP Implementation Work Plan. Table 2 presents the detailed groundwater/surface water monitoring program for each well and seep location included in the program.

### 5.1 MONITORING LOCATIONS AND ANALYTICAL PROGRAM

Following completion of Phase 1 construction activities, groundwater and surface water samples will be collected on a quarterly basis from the following monitoring wells and seep locations in the vicinity of the Commissary Seeps and Building 610:

- Downgradient monitoring wells: 600GW101 (600GW101R after replacement), 610GW101, 610GW102, and 610GW103;
- Upgradient monitoring well: 600GW106; and
- Surface water seeps: 610SP01 and 610SP02.

As discussed in Section 3.3.4, well 600GW101 will be destroyed prior to Phase 1 excavation of the TPHg Source Area. Replacement well 600GW101R will be re-installed following soil excavation activities and monitored.

Groundwater and surface water samples from the wells and seep locations listed above will be analyzed for the following petroleum-related constituents on a semi-annual basis:

- TPHg, TPHd and/or TPHfo by EPA Method 8015 Modified and EPA 3630A Silica Gel Cleanup, and
- BTEX and MTBE by EPA 8021B or 8020.

Groundwater and surface water samples from the wells and seep locations listed above also will be analyzed for arsenic and related constituents on a quarterly basis to assess whether arsenic concentrations in wells and seep samples at the site show trends over time and further evaluate the relationship between arsenic concentrations, TPH concentrations, Bay Mud, or other factors that affect redox conditions and therefore, the solubility of arsenic in groundwater. Samples collected from the wells and seep locations above will be analyzed for the following parameters:

- Dissolved arsenic, iron, manganese, and aluminum (EPA 6010-6020);
- Total arsenic, iron, manganese, and aluminum (EPA 6010-6020), at seep locations only;
- General chemistry parameters: alkalinity (total), bicarbonate, carbonate, chloride, fluoride, nitrate as N, and nitrite as N, and sulfate (by various analytical methods);
- Total dissolved solids (EPA 160.1); and
- Field parameters including DO, oxidation reduction potential (ORP), specific conductance, and pH.

Dissolved arsenic, iron, and manganese, will be analyzed, and DO and ORP will be field-measured to evaluate the redox state of the groundwater. Aluminum will be monitored for quality control (QC) purposes, to evaluate if there has been breakthrough of the filters used for sampling.

## 5.2 SAMPLING PROCEDURES, QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) AND DATA VALIDATION

Prior to sampling, groundwater elevations will be measured, monitoring wells will be purged, and groundwater samples will be collected, preserved and handled following procedures described in the Presidio Standard Operating Procedures (SOPs; Tetra Tech, 2001) and Field Sampling Plan (FSP; Treadwell & Rollo, 2001). Monitoring will be conducted as part of the

Presidio-wide groundwater monitoring program and results will be documented in Semi-Annual Groundwater Monitoring Reports. The QA/QC program will be in accordance with the Presidio-wide Quality Assurance Project Plan Sampling and Analysis Plan (QAPP; Tetra Tech, 2001). QA/QC samples will include duplicates, equipment rinsate blanks, trip blanks, source water blanks, temperature blanks, and matrix spike/matrix spike duplicates. Field documentation will be in accordance with the FSP and SOPs. Analytical methods and reporting limits will conform to those described in the QAPP. The laboratory will provide electronic data deliverables (EDDs) that will be validated and imported into the Presidio database. For each sampling event, an appropriate third party firm (e.g., DataVal) will independently review laboratory data and provide a Quality Control Summary Report.

## 5.3 MONITORING FREQUENCY AND DURATION

For the petroleum-related constituents in the vicinity of the Commissary Seeps and Building 610, the semi-annual sampling will be conducted until implementation of Phase 2 corrective actions so that levels of petroleum-related constituents can be assessed over time following Phase 1 corrective action and until Phase 2 is implemented. This monitoring is expected to demonstrate that the two-phased approach for corrective action at the Study Area is protective of groundwater and the Crissy Field Marsh.

Arsenic and the related constituents will be monitored for four quarters to evaluate if the concentrations show trends and refine the conceptual model for arsenic in groundwater. Following the one-year monitoring period, analyses of arsenic and related constituents will be reduced to a semi-annual basis until Phase 2 implementation, assuming arsenic levels are maintained at consistent levels or have decreased to concentrations below the cleanup level. If arsenic levels increase, analyses of arsenic and related constituents will continue on a quarterly basis.

It is noted that the monitoring program (including seeps and wells to be sampled, analytical suites, and monitoring frequency) described in this section will be reviewed by the Trust on an ongoing basis and the Trust may request adjustments to this monitoring program, subject to RWQCB approval. In the Phase 2 CAP Implementation Work Plan, the Phase 1 groundwater and surface water monitoring data will be reviewed to assess the need for further monitoring.

All Study Area wells will remain in-place until decisions are made regarding the Phase 2 corrective action program. Once it is determined that a well will no longer be monitored under Phase 1 or 2, the Trust will request approval from the RWQCB for abandonment of the well.

## 6.0 CAP IMPLEMENTATION REPORT

Upon completion of the construction activities described in this Work Plan, the Site Engineer will prepare a Phase 1 CAP Implementation Report (Implementation Report). The Implementation Report will include:

1. Detailed summary of the soil corrective action activities completed;
2. Confirmation soil sampling data and associated survey data;
3. Waste characterization analytical data;
4. Copies of waste manifests and supporting waste disposal information;
5. As-built drawings;
6. Boring log and monitoring well completion log for replacement monitoring well;
7. De-watering water sampling analytical data;
8. A photographic record of the work; and
9. A description of proposed LUCs for the project, if necessary (including a copy of the proposed site specific LUCMRR addendum).

## 7.0 SCHEDULE

Implementation of this work plan is scheduled to commence on June 9, 2006. The planned work sequence and projected schedule for major construction milestones are presented on Figure 7. The current schedule provides the best opportunity to minimize impacts to participants of several large events that are scheduled to occur in the Crissy Field area in 2006. A CAP Implementation Report documenting the Phase 1 corrective action outlined in this work plan will be submitted to the RWQCB by March 30, 2007.

As discussed in the Revised Final CAP, a Phase 2 CAP Work Plan will be prepared within 6 months of a determination concerning the Crissy Field Marsh expansion or submitted no later than September 1, 2008. Implementation of the Phase 2 corrective actions will commence no

later than the end of 2008. A CAP Implementation Report Addendum will be prepared documenting implementation of the Phase 2 corrective actions. This addendum report will be submitted to the RWQCB within six months of Phase 2 construction completion.

## 8.0 REFERENCES

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# TABLES

**TABLE 1**
**SUMMARY OF SOIL CLEANUP LEVELS**
**Commissary / PX Study Area**
Presidio of San Francisco, California

| Constituent | Applicable Cleanup Levels | | | | | Effective Cleanup Levels [4] | | | | Reporting/Detection Limits | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Human Health Recreational Cleanup Level (mg/kg) | Human Health Residential Cleanup Level (mg/kg) | Ecological Buffer Zone (Terrestrial) Cleanup Level (mg/kg) | Saltwater Ecological Protection Zone Cleanup Level (mg/kg) | Groundwater Protection at Crissy Field Cleanup Level (<5 feet above groundwater) (mg/kg) | Unrestricted land use with protection of Crissy Field Marsh water quality (mg/kg) | Unrestricted land use without protection of Crissy Field Marsh water quality (mg/kg) | Restricted land use with protection of Crissy Field Marsh water quality (mg/kg) | Restricted land use without protection of Crissy Field Marsh water quality (mg/kg) | QAPP Analytical Reporting Limits (mg/kg) | Laboratory Detection Limit (mg/kg) |
| **Petroleum Hydrocarbons and Gasoline-related VOCs [1]** | | | | | | | | | | | |
| TPH as gasoline ($C_7$-$C_{12}$) | 2,400 | 1,030 | 610 | 11.6 | 1,690 | 11.6 | 610 | 11.6 | 610 | 1.0 | 0.001 |
| TPH as diesel ($C_{12}$-$C_{24}$) | 3,200 | 1,380 | 700 | 144 | 1,950 | 144 | 700 | 144 | 700 | 10 | 0.001 |
| TPH as fuel oil ($C_{24}$-$C_{36}$) [5] | 4,500 | 1,900 | 980 | 144 | 2,730 | 144 | 980 | 144 | 980 | 10 | 0.005 |
| Benzene | 1.5 | 0.6 | 40 | 50 | 1 | 0.6 | 0.6 | 1 | 1 | 0.005 | 0.005 |
| Toluene | 1,200 | 840 | 270 | 260 | 14 | 14 | 14 | 14 | 14 | 0.005 | 0.005 |
| Ethylbenzene | 1,900 | 530 | 125 | 5 | 19 | 5 | 19 | 19 | 19 | 0.010 | 0.005 |
| Total Xylenes | 2,500 | 1,080 | 55 | 22 | 4,340 | 22 | 55 | 22 | 55 | 0.005 | 0.005 |
| MTBE | -- | -- | -- | 190 | -- | 190 | -- | 190 | -- | -- | 0.020 |
| **Metals [2]** | | | | | | | | | | | |
| Arsenic | 0.88 | 0.36 | 64 | -- | -- | 5.9 [6] | 5.9 [6] | 5.9 [6] | 5.9 [6] | 0.2 | 0.25 |
| Cadmium | 4.2 | 1.7 | 0.23 | -- | -- | 1.7 [6] | 1.7 [6] | 1.7 [6] | 1.7 [6] | 0.1 | 0.25 |
| Chromium | 2,800 | 1,200 | 23 | -- | -- | 120 [6] | 120 [6] | 120 [6] | 120 [6] | 0.2 | 0.5 |
| Copper | -- | -- | 120 | -- | -- | 120 | 120 | 120 | 120 | 0.2 | 0.5 |
| Lead | 500 | 400 | 300 | -- | -- | 300 | 300 | 300 | 300 | 0.1 | 0.15 |
| Nickel | 3,500 | 1,400 | 71 | -- | -- | 71 | 71 | 71 | 71 | 0.2 | 1 |
| Zinc | 52,000 | 22,000 | 50 | -- | -- | 66 [6] | 66 [6] | 66 [6] | 66 [6] | 0.2 | 1 |
| **PAHs [3]** | | | | | | | | | | | |
| Anthracene | 13,800 | 5,900 | 40 | -- | 1,120 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Benzo(a)anthracene | 0.65 | 0.27 | 40 | -- | 23 | 0.27 | 0.27 | 0.65 | 0.65 | 0.33 | 0.005 |
| Benzo(a)pyrene | 0.065 | 0.027 | 0.3 | -- | 9 | 0.027 | 0.027 | 0.065 | 0.065 | 0.33 | 0.005 |
| Benzo(b)fluoranthene | 0.65 | 0.27 | 40 | -- | 64 | 0.27 | 0.27 | 0.65 | 0.65 | 0.33 | 0.005 |
| Benzo(g.h.i)perylene | 1,400 | 620 | 40 | -- | 19,500 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Benzo(k)fluoranthene | 0.65 | 0.27 | 40 | -- | 64 | 0.27 | 0.27 | 0.65 | 0.65 | 0.33 | 0.005 |
| Chrysene | 6.5 | 2.7 | 40 | -- | 151 | 2.7 | 2.7 | 6.5 | 6.5 | 0.33 | 0.005 |
| Dibenz (ah) anthracene | 0.19 | 0.78 | 40 | -- | -- | 0.19 | 0.19 | 0.19 | 0.19 | 0.33 | 0.005 |
| Fluoranthene | 1,900 | 820 | 40 | -- | 1,160 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Fluorene | 1,800 | 770 | 40 | -- | 220 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Indeno(1,2,3-cd)pyrene | 0.65 | 0.27 | 40 | -- | -- | 0.27 | 0.27 | 0.65 | 0.65 | 0.33 | 0.005 |
| Naphthalene | 1,100 | 480 | 40 | -- | 140 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Phenanthrene | 1,400 | 600 | 40 | -- | 410 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| Pyrene | 1,400 | 620 | 40 | -- | 910 | 40 | 40 | 40 | 40 | 0.33 | 0.005 |
| **Soil RUs Selected for Each Effective Cleanup Level Category [4]** | | | | | | (1) TPHg Source Area (Area A only) | (1) FDS Pipeline Residuals Area 1, (2) FDS Pipeline Residuals Area 3 | (1) FDS Pipeline Residuals Area 2, (2) Building 626 Area (Accessible Locations), (3) TPHg Source Area (Area B only) | Phase 2 Area RUs | | |

**TABLE 1**
**SUMMARY OF SOIL CLEANUP LEVELS**
**Commissary / PX Study Area**
Presidio of San Francisco, California

Notes:

[1] Applicable cleanup levels for TPH, BTEX, and MTBE compiled from Tables 1, 2, 5, and 6 in Order No. R2-2003-0080 Site Cleanup Requirements, Presidio of San Francisco (RWQCB, 2003).

[2] Applicable cleanup levels for metals compiled from Table 7-2 of the Cleanup Levels Document (EKI, 2002).

[3] Applicable cleanup levels for PAHs compiled from Tables 1, 2, and 5 in Order No. R2-2003-0080 Site Cleanup Requirements, Presidio of San Francisco (RWQCB, 2003) for petroleum-related PAHs and Table 7-2 from the Cleanup Levels Document (EKI,2002) for non-petroleum related PAHs. Because PAHs at the Study Area could be derived for petroleum or non-petroleum related sources (e.g., fill material), the lowest applicable cleanup levels from these two sources are selected as the applicable cleanup levels for PAHs.

[4] Target effective cleanup levels used for corrective action:

- Unrestricted land use with protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area A and the 150-foot marsh buffer zone (includes the Area A portion of the TPHg Source Area).
- Unrestricted land use without protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area A and outside of the 150-foot marsh buffer zone (includes FDS Pipeline Residuals Areas 1 and 3).
- Restricted land use with protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area B and within the 150-foot marsh buffer zone (includes FDS Pipeline Residuals Area 2, Accessible Locations of the Building 626 Area, and the Area B portion of the TPHg Source Area).
- Restricted land use without protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone ); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels may be used for the Phase 2 Area RUs, assuming the Crissy Field Marsh is not expanded into the area. This determination will be made in consultation with the RWQCB.

[5] TPH as fuel oil uses a motor oil standard for carbon range C24-C36.

[6] In the case of metals, if the background concentration for Beach/Dune Sand is greater than the most stringent cleanup level, then the background concentration applies as the cleanup level. Source: Table 7-2 (non-petroleum compounds) in the Cleanup Levels Document (EKI, 2002).

Abbreviations:

mg/kg - milligrams per kilogram
MTBE - Methyl tert-butyl ether
PAHs - Polycyclic aromatic hydrocarbons
TPH - Total petroleum hydrocarbons
-- - No cleanup level available
RU - Remedial unit

**TABLE 2**
**GROUNDWATER AND SURFACE WATER MONITORING PROGRAMS FOR COMMISSARY SEEPS GROUNDWATER REMEDIAL UNITS**
**Commissary / PX Study Area**
Presidio of San Francisco, California

| Location ID | New or Existing Sampling Location[1] | Water Level/ Seep Evaluation | Sampling Method | Monitoring Location Rationale | Analytical Requirements | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | General Chemistry[2] | Dissolved Metals[3] | Total Metals (Not Filtered)[3] | Total Dissolved Solids | BTEX and MTBE | Total Petroleum Hydrocarbons[4] |
| | | | | | Various | EPA 6010/6020 | EPA 6010/6020 | EPA 160.1 | EPA 8021B or 8020 | EPA 8015/ EPA 3630A |
| 600GW101 | Existing/ Replaced[5] | During Each Sampling Event | Low Flow | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 600GW102 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW103 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW104 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW105 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW106 | Existing | During Each Sampling Event | Low Flow | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 600GW107 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW108 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 600GW109 | Existing | During Each Sampling Event | N/A | N/A | | | | | | |
| 610GW101 | Existing | During Each Sampling Event | Low Flow | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 610GW102 | Existing | During Each Sampling Event | Low Flow | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 610GW103 | Existing | During Each Sampling Event | Low Flow | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 610SP01 | Existing | During Each Sampling Event | Surface[6] | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |
| 610SP02 | Existing | During Each Sampling Event | Surface[6] | Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents. | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q for year 1; followed by Q1, Q3 | Q1, Q3 | Q1, Q3 |

Notes

Q1, Q3 = Semi-annual sampling (Quarters 1 and 3).

Q = Quarterly sampling.

Note: This monitoring program will be implemented following Phase 1 construction activities and will continue until Phase 2 implementation. The need for additional monitoring will be evaluated in the Phase 2 CAP Implementation Work Plan. Section 5.0 of the text provides additional details regarding the monitoring program.

[1] All Study Area wells will remain in place until Phase 2 implementation. The Trust will then request approval for abandonment from the RWQCB for wells no longer included in the monitoring program.

[2] General Chemistry Parameters include: alkalinity (total), bicarbonate, carbonate, chloride, fluoride, nitrate as N, nitrite as N, and sulfate. Dissolved Oxygen (DO) concentrations and oxidation reduction potential (ORP) will be recorded immediately before sample collection and recorded in field sampling logs.

[3] Metals List includes: Al, As, Fe, and Mn.

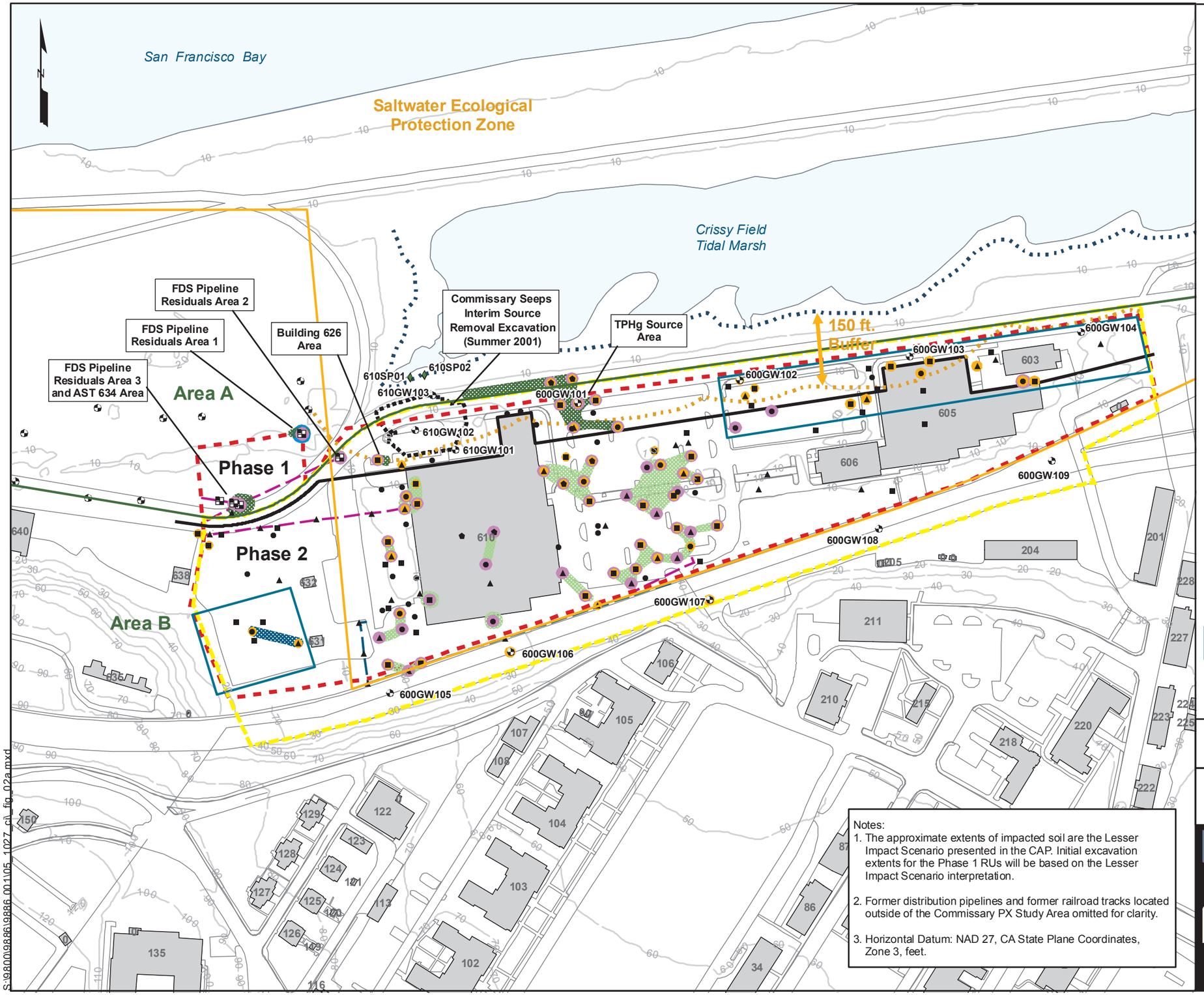
[4] Samples will be analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), diesel (TPHd), and fuel oil (TPHfo), with respective carbon ranges of C7 - C12, C12 - C24, and C24 - C36, by EPA Method 8015 modified and silica gel cleanup by EPA Method 3630A.

[5] Well 600GW101 will be abandoned as part of the preferred remedial alternative; it will be replaced after completion of remedial construction activities.

[6] Surface water seeps will be sampled per Standard Operating Procedure. For metals analysis, two samples will be collected; one will be filtered and analyzed for dissolved metals and one will not be filtered and analyzed for total metals.

# FIGURES

AREA A
AREA B
Commissary/PX
Study Area
SAN FRANCISCO BAY
FORT POINT NHS
TO GOLDEN GATE BRIDGE
TORPEDO WHARF
COAST GUARD PIER
GOLDEN GATE PROMENADE
CRISSY FIELD
MARINA GATE
FORT WINFIELD SCOTT
LOG CABIN
RECYCLING & SALVAGE CENTER
NATIVE PLANT NURSERY
SAN FRANCISCO NATIONAL CEMETERY
GOLDEN GATE CLUB
MAIN POST
PRESIDIO TRUST
NPS VISITOR CENTER
POST CHAPEL
HERBST INTERNATIONAL EXHIBITION HALL
BOWLING CENTER
THEATER
GYM
LETTERMAN COMPLEX
LOMBARD GATE
EAST HOUSING
CHILD CARE CENTER
OFFICERS' CLUB
BAKER BEACH APARTMENTS
BOB HILL CAMPGROUND
PRESIDIO GOLF COURSE
PUBLIC HEALTH SERVICE HOSPITAL
PRESIDIO TRUST FACILITIES
5TH AVENUE GATE
15TH AVENUE GATE
MOUNTAIN LAKE
MOUNTAIN LAKE PARK
ARGUELLO GATE
PRESIDIO GATE
INSPIRATION POINT
EL POLIN SPRINGS
POP HICKS FIELD
MORTON STREET FIELD
PAUL GOODE FIELD
JULIUS KAHN PLAYGROUND
PALACE OF FINE ARTS
EXPLORATORIUM
Marina Blvd
Lombard Street
Greenwich
Filbert
Union
Green
Vallejo
Broadway
Pacific
Jackson
Washington
Clay
Sacramento
California
Presidio Terrace
Arguello Blvd
Cherry
Maple
Spruce
Locust
Laurel
Walnut
Lyon
Baker
Beach
North Point
Bay
Francisco
Chestnut
Gorgas Ave
Richardson Ave
Jefferson Street
Lincoln Blvd
Crissy Field Center
Mason
Taylor
Larkin
Polk
Van Ness
Gough
Franklin
Octavia
Laguna
Buchanan
Webster
Fillmore
Steiner
Pierce
Scott
Divisadero
Broderick
Baker
Lyon
Presidio
Walnut
Locust
Spruce
Maple
Cherry
Arguello Blvd
Presidio Blvd
Washington Blvd
Lincoln Blvd
Marina Blvd
Lombard Street
Richardson Ave
Gorgas Ave




Explanation

- Phase 1 - Soil Sample Location
- Phase 1 - Soil & Groundwater Grab Sample Location
- Phase 2 - Soil Sample Location
- Phase 2 - Soil & Groundwater Grab Sample Location
- Groundwater Monitoring Well Location
- Surface Seep Sampling Locations
- Army FDS Closure Excavation Soil Sample (IT, 1999)
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- Known or Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- 610 — Existing Structure and Identification Number
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- BTEX Exceedance in Soil Samples
- Approximate Extent of Impacted Soil at CERCLA Sites
- Approximate Extent of Phase 1 Impacted Soil
- Approximate Extent of Phase 2 Impacted Soil
- Selected remedial action for areas CERCLA Sites presented in Draft Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and twenty-seven other sites, Presidio of San Francisco, MACTEC, 2004

0 200 Feet

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Former distribution pipelines and former railroad tracks located outside of the Commissary PX Study Area omitted for clarity.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

# SITE PLAN WITH PHASE 1 AND PHASE 2 EXCAVATION AREAS

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THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
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415/561-5300
fax 415/561-5315

June 2006

FIGURE 2A

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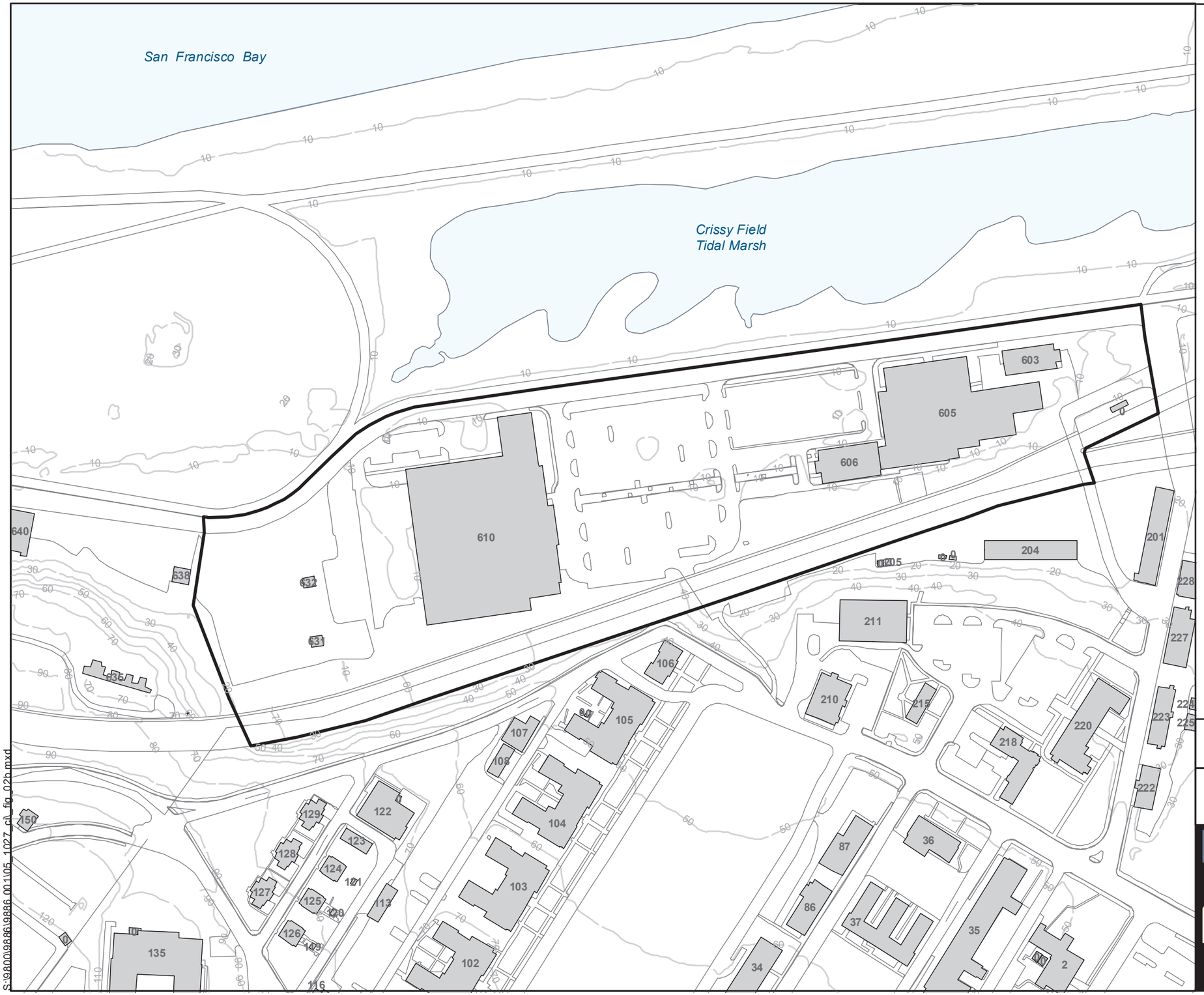


Explanation

Land Use Control Area

610 Existing Structure and Identification Number

N

0 200 Feet

# LAND USE CONTROL AREA

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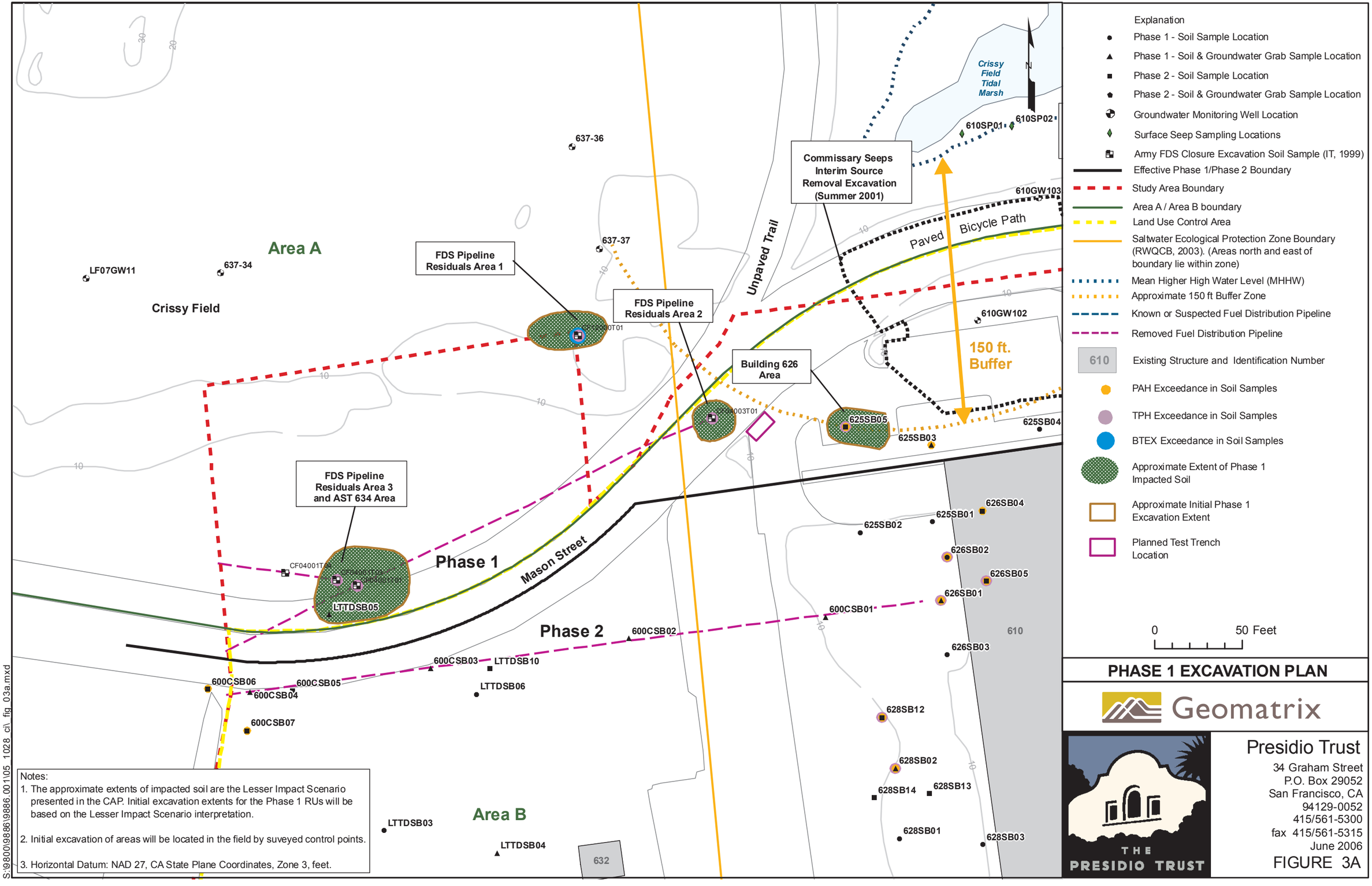
FIGURE 2B

S:\9400\9486\9886.001105_1027_cli_fig_02b.mxd




Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Initial excavation of areas will be located in the field by suveyed control points.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

S:\9800\9886\9886.001\05 1028 ci\ fig 03a.mxd

# PHASE 1 EXCAVATION PLAN

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June 2006

FIGURE 3A

Crissy Field Tidal Marsh

Saltwater Ecological Protection Zone

Commissary Seeps Interim Source Removal Excavation (Summer 2001)

Area A

Area B

Phase 1

Phase 2

Paved Bicycle Path

Mason Street

150 ft. Buffer

TPHg Source Area

610

600RRSB05
600RRSB07
600RRSB09
600RRSB08
600RRSB01
T609SB06
T609SB05
T609SB04
T609SB02
T609SB01
T609SB03
610GW101
610SB02
610SB03
610SB01
610SB04
613SB01
S15SB04
613SB02
613SB03
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T615SB02
T615SB01
619SB05
619SB04
619SB03
619SB01
619SB02
600ASB09
600ASB01
600ASB02

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Initial excavation of areas will be located in the field by suveyed control points.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

Explanation

- Phase 1 - Soil Sample Location
- Phase 1 - Soil & Groundwater Grab Sample Location
- Phase 2 - Soil Sample Location
- Phase 2 - Soil & Groundwater Grab Sample Location
- Groundwater Monitoring Well Location
- Surface Seep Sampling Locations
- Army FDS Closure Excavation Soil Sample (IT, 1999)
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- Known or Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- 610 — Existing Structure and Identification Number
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- Approximate Extent of Phase 1 Impacted Soil
- Selected remedial action for CERCLA Sites presented in Draft Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and twenty-seven other sites, Presidio of San Francisco, MACTEC, 2004
- Approximate Initial Phase 1 Excavation Extent
- Planned Test Trench Location

0 60 Feet

# PHASE 1 EXCAVATION PLAN

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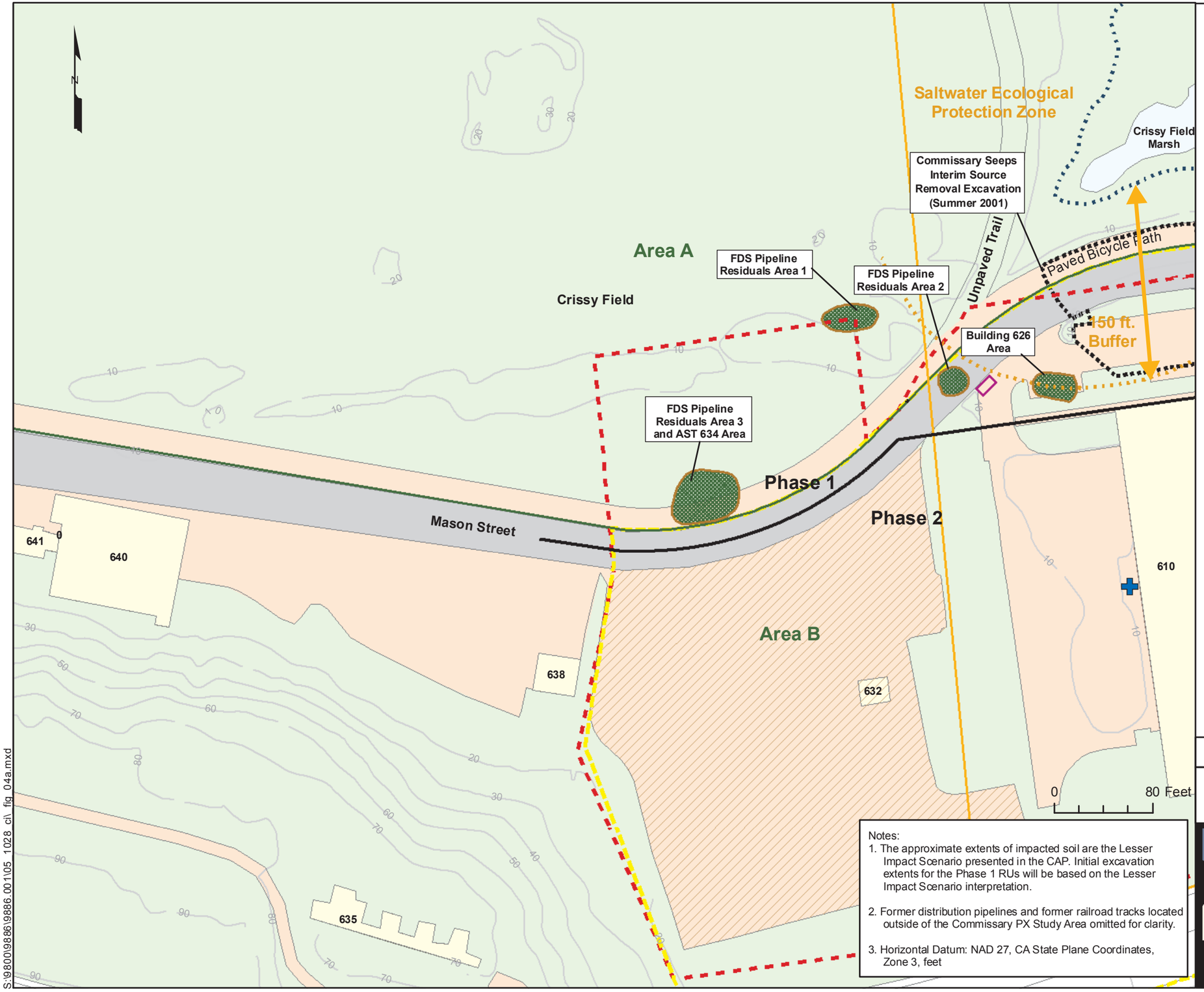
June 2006

FIGURE 3B

S:\9800\9886\9886.001\05 1028 cil fig 03b.mxd




Explanation

- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Initial Phase 1 Excavation Extent
- Planned Test Trench Location
- Unpaved Area
- Existing Building Area
- Light Use Asphalt Pavement Area
- Mason Street Asphalt Pavement Area
- Potential Dewatering Discharge Location
- Soil Stockpiling and Truck and Equipment Staging Area
- Approximate Extent of Phase 1 Impacted Soil

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Former distribution pipelines and former railroad tracks located outside of the Commissary PX Study Area omitted for clarity.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

**WORK PLAN AREA**

Geomatrix

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FIGURE 4A

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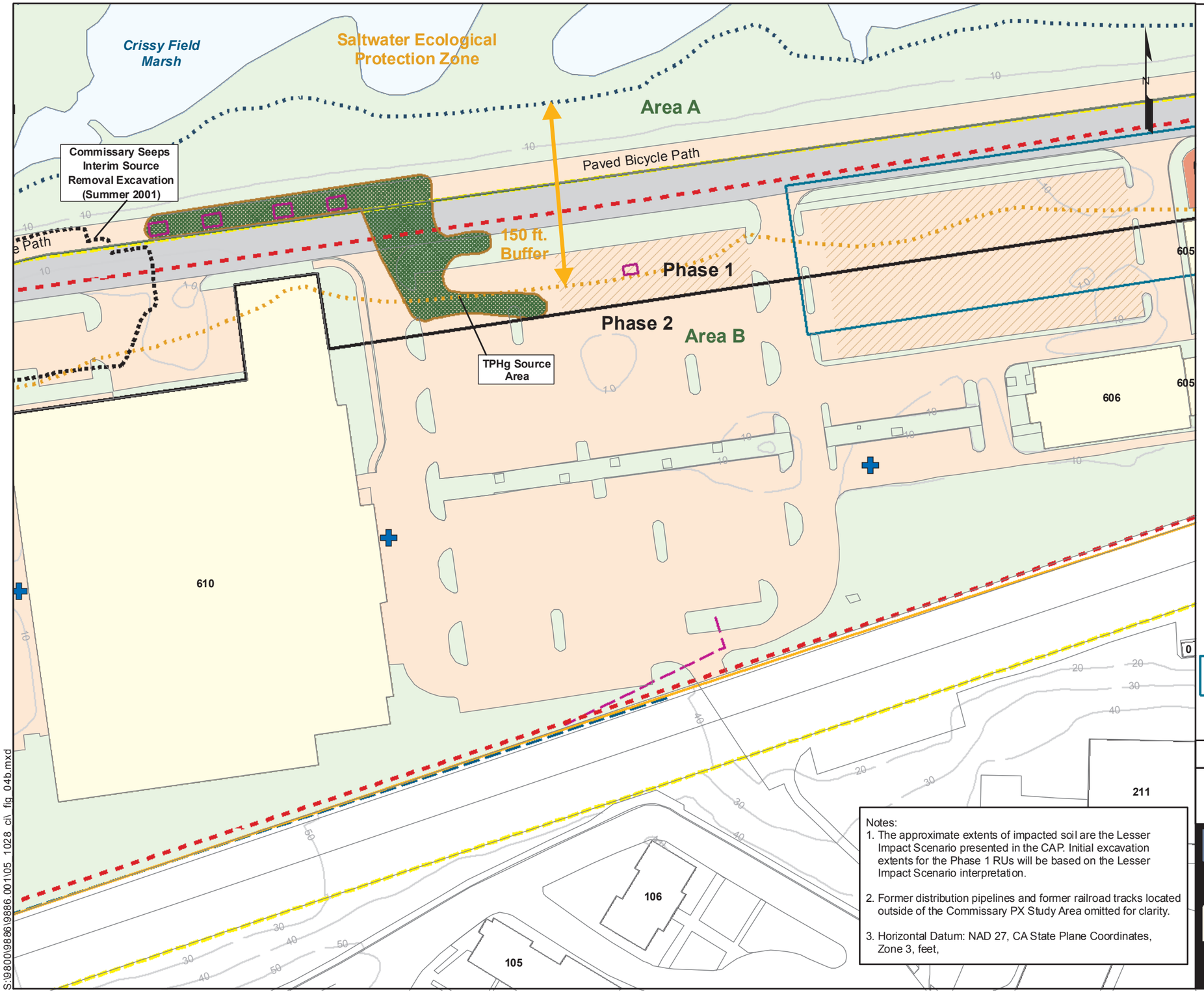


Explanation

- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- Known or Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- 610 — Existing Structure and Identification Number
- Approximate Initial Phase 1 Excavation Extent
- Planned Test Trench Location
- Unpaved Area
- Existing Building Area
- Light Use Asphalt Pavement Area
- Mason Street Asphalt Pavement Area
- Potential Dewatering Discharge Location
- Soil Stockpiling and Truck and Equipment Staging Area
- Approximate Extent of Phase 1 Impacted Soil
- Selected remedial action for areas east of arrows presented in Draft Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and twenty-seven other sites, Presidio of San Francisco, MACTEC, 2004

0 80 Feet

**WORK PLAN AREA**

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Former distribution pipelines and former railroad tracks located outside of the Commissary PX Study Area omitted for clarity.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet,

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FIGURE 4B

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Explanation

Authorized Haul Roads, Inbound

Authorized Entry and Exit Routes/Gates:

-Via Golden Gate Bridge Toll Plaza
-Via Doyle Drive and Highway 101
-Via 19th Avenue/State Highway 1
-Gorgas Gate to be used only for entry from Southbound Highway 101
-Use Richardson slip ramp for entry from Northbound Highway 101
-No entry or exit via Lombard, Marina, Presidio Arguello, 15th Avenue, or 25th Avenue

Notes:

1. Additional truck staging will be made available within designated portions of Bank Street located south of the Building 610 parking lot, and the Building 605 parking lot, and the parking lot east of Building 638, in accordance with the Traffic and Signage Plan (Appendix B).

2. Traffic within the immediate vicinity of the work area will be routed in accordance with the Traffic and Signage Plan (Appendix B).

N

0 1,000 Feet

**AUTHORIZED HAUL ROADS INBOUND**

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FIGURE 5

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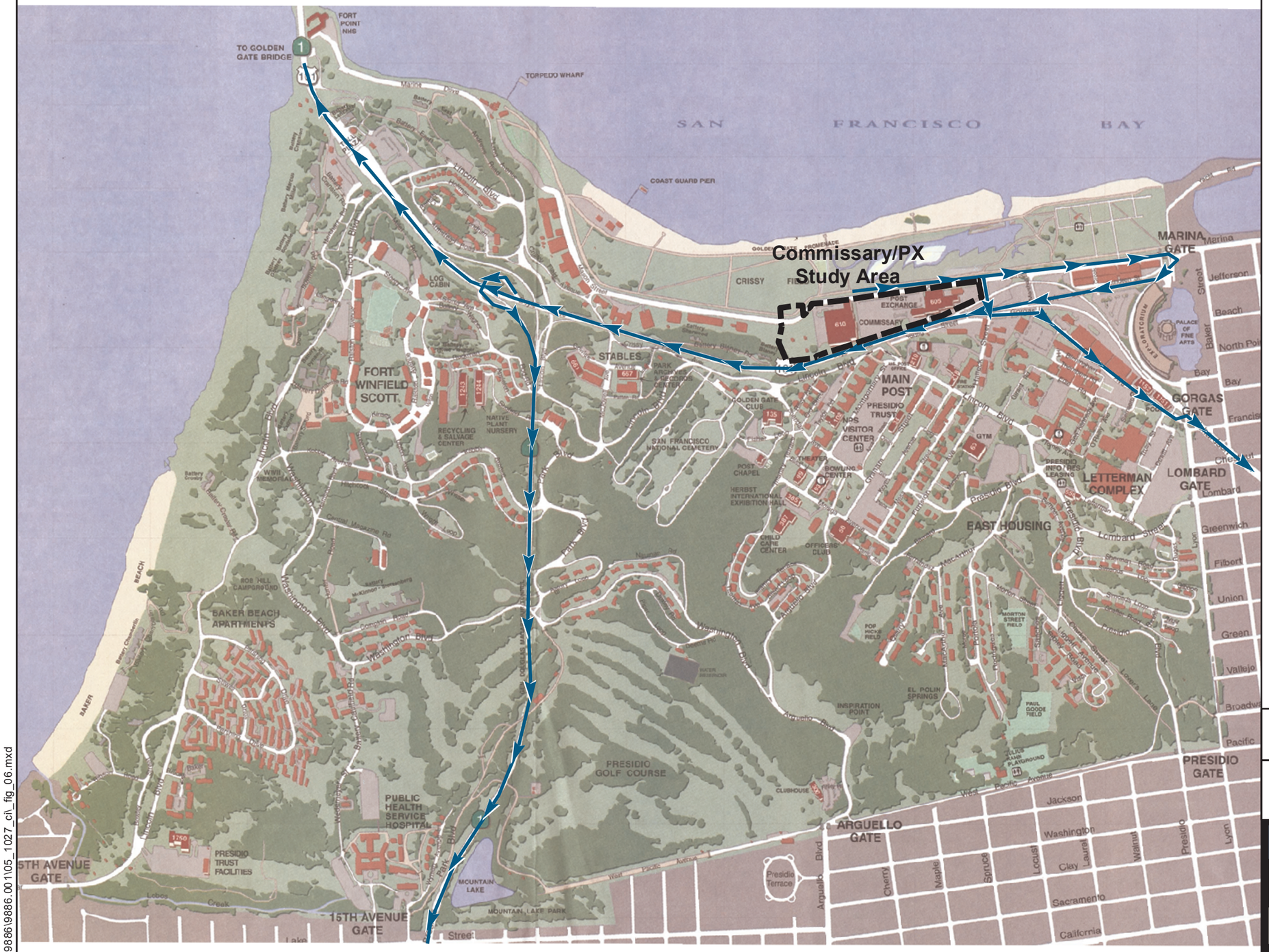


Explanation

Authorized Haul Roads, Outbound

Authorized Entry and Exit Routes/Gates:

-Via Golden Gate Bridge Toll Plaza
-Via Doyle Drive and Highway 101
-Via 19th Avenue/State Highway 1
-Gorgas Gate to be used only for exit to Southbound Highway 101
-Marina Gate to be used only for exit to Northbound Highway 101
-No entry or exit via Lombard, Presidio Arguello, 15th Avenue, or 25th Avenue

Notes:

1. Additional truck staging will be made available within designated portions of Bank Street located south of the Building 610 parking lot, and the Building 605 parking lot, and the parking lot east of Building 638, in accordance with the Traffic and Signage Plan (Appendix B).

2. Traffic within the immediate vicinity of the work area will be routed in accordance with the Traffic and Signage Plan (Appendix B).

N

0 1,000 Feet

**AUTHORIZED HAUL ROADS OUTBOUND**

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FIGURE 6

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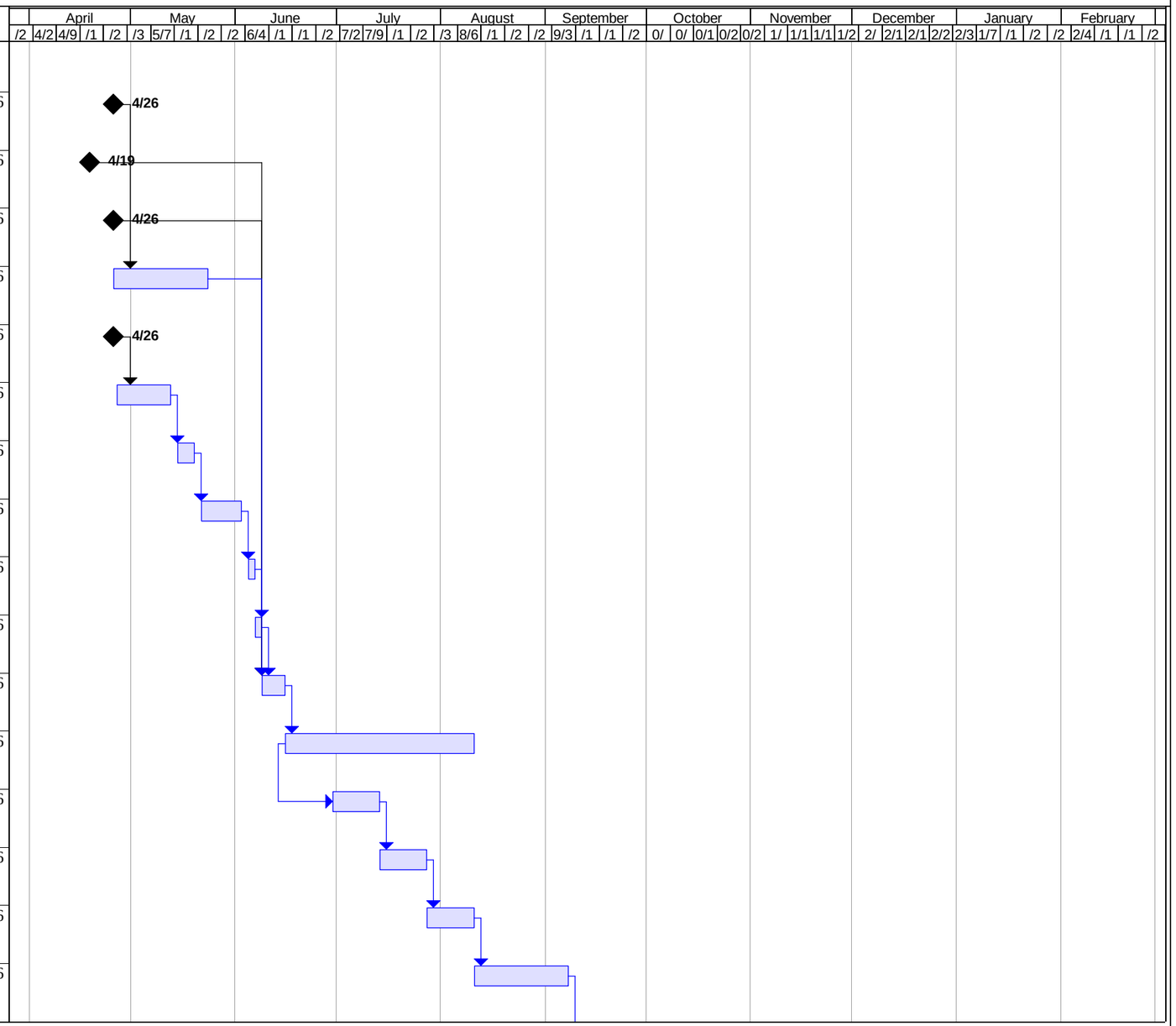
Figure 7
Projected Schedule -- Phase 1 CAP Work Plan Implementation
Commissary/PX Study Area
Presidio of San Francisco, California

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | | | | |
| 2 | CAP Implementation Work Plan Submittal to RWQCB | 0 days | Wed 4/26/06 | Wed 4/26/06 |
| 3 | NPS NEPA Project Review | 0 days | Wed 4/19/06 | Wed 4/19/06 |
| 4 | NPS 5X Review | 0 days | Wed 4/26/06 | Wed 4/26/06 |
| 5 | RWQCB Review and Approval of Latest Modifications to CAP and CAP Implementation Work Plan | 4 wks | Wed 4/26/06 | Tue 5/23/06 |
| 6 | Finalize Bid Documents | 0 days | Wed 4/26/06 | Wed 4/26/06 |
| 7 | Contractor Bidding Period | 16 edays | Wed 4/26/06 | Fri 5/12/06 |
| 8 | Contractor Selection and Execution of Contract | 1 wk | Mon 5/15/06 | Fri 5/19/06 |
| 9 | Submittal Preparation by Contractor | 2 wks | Mon 5/22/06 | Fri 6/2/06 |
| 10 | Trust Review of Contractor Submittals | 2 days | Mon 6/5/06 | Tue 6/6/06 |
| 11 | Contractor Finalizes Submittals | 2 days | Wed 6/7/06 | Thu 6/8/06 |
| 12 | Contractor Mobilization | 5 days | Fri 6/9/06 | Thu 6/15/06 |
| 13 | Excavate, Backfill, and Restore TPHg Source Area and Associated Test Trenches | 8 wks | Fri 6/16/06 | Thu 8/10/06 |
| 14 | Establish and Maintain Realignment No. 1 of the Pedestrian and Bicycle Path | 2 wks | Fri 6/30/06 | Thu 7/13/06 |
| 15 | Establish and Maintain Realignment No. 2 of the Pedestrian and Bicycle Path | 2 wks | Fri 7/14/06 | Thu 7/27/06 |
| 16 | Establish and Maintain Realignment No. 3 of the Pedestrian and Bicycle Path | 2 wks | Fri 7/28/06 | Thu 8/10/06 |
| 17 | Excavate, Backfill, and Restore Building 626 Area | 4 wks | Fri 8/11/06 | Thu 9/7/06 |

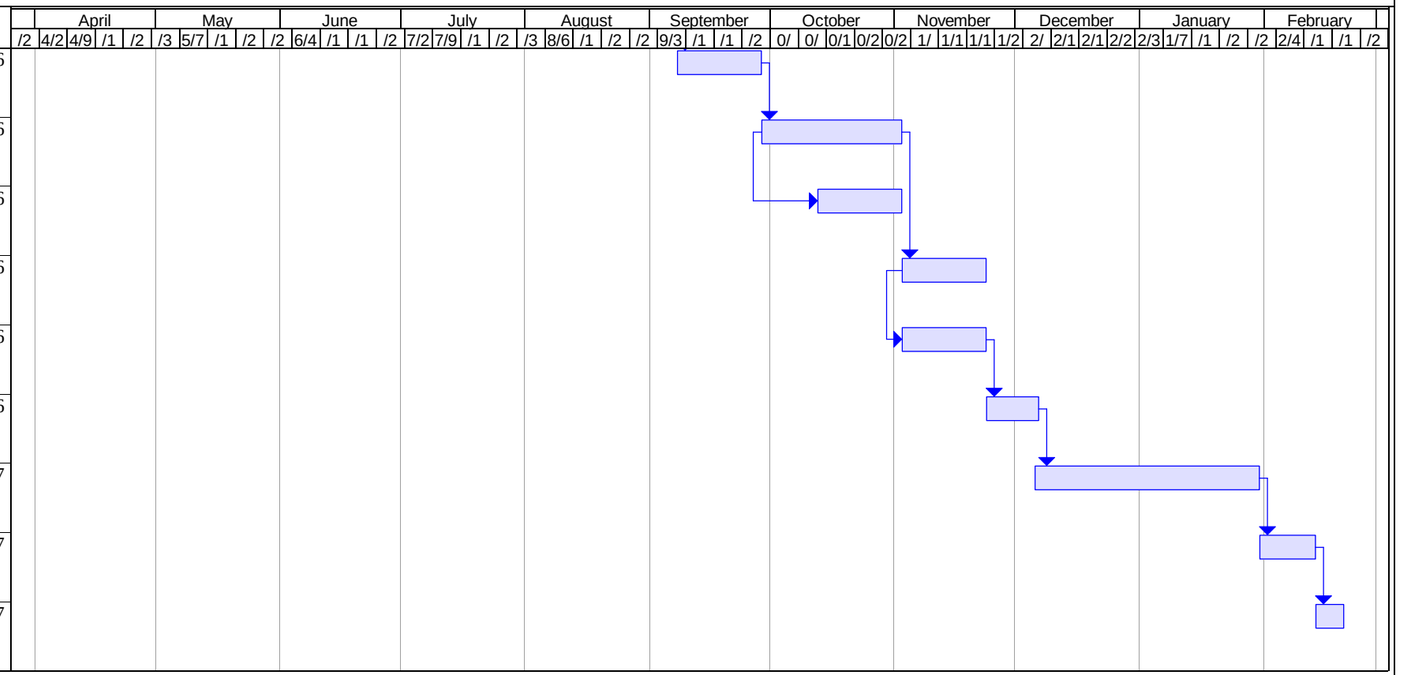



Project: 009886.000.0
Date: June 2, 2006

Task Milestone

Figure 7
Projected Schedule -- Phase 1 CAP Work Plan Implementation
Commissary/PX Study Area
Presidio of San Francisco, California

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 18 | Excavate, Backfill, and Restore FDS Pipeline Residuals Area 1 | 3 wks | Fri 9/8/06 | Thu 9/28/06 |
| 19 | Excavate, Backfill, and Restore FDS Pipeline Residuals Area 3 and AST 634 Area | 5 wks | Fri 9/29/06 | Thu 11/2/06 |
| 20 | Establish and Maintain Realignment of the Pedestrian and Bicycle Path | 3 wks | Fri 10/13/06 | Thu 11/2/06 |
| 21 | Establish and Maintain Realignment of Mason Street | 3 wks | Fri 11/3/06 | Thu 11/23/06 |
| 22 | Excavate, Backfill, and Restore FDS Pipeline Residuals Area 2 | 3 wks | Fri 11/3/06 | Thu 11/23/06 |
| 23 | Contractor Demobilization | 9 days | Fri 11/24/06 | Wed 12/6/06 |
| 24 | Prepare CAP Implementation Report | 8 wks | Wed 12/6/06 | Tue 1/30/07 |
| 25 | NPS Review of CAP Implementation Report | 2 wks | Wed 1/31/07 | Tue 2/13/07 |
| 26 | Finalize CAP Implementation Report | 1 wk | Wed 2/14/07 | Tue 2/20/07 |




Project: 009886.000.0
Date: June 2, 2006

Task

Milestone

# APPENDIX A

# Storm Water Pollution Prevention Plan

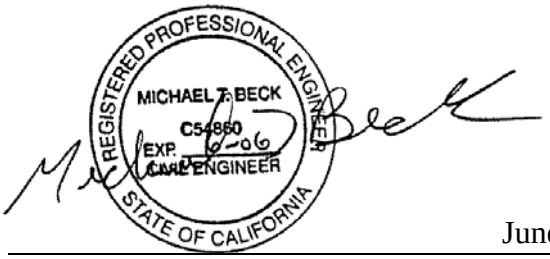
Geomatrix

**CERTIFICATION**

**STORM WATER POLLUTION PREVENTION PLAN**
Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, California

June 2, 2006
Project 9886.000

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel prepared the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for preparing the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.




June 2, 2006

Authorized Representative Date

# APPENDIX A

# STORM WATER POLLUTION PREVENTION PLAN

Commissary/PX Study Area
Presidio of San Francisco, California

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# APPENDIX A

## STORM WATER POLLUTION PREVENTION PLAN

Commissary/PX Study Area
Presidio of San Francisco, California

### AMENDMENTS

Amendment of this Storm Water Pollution Prevention Plan (SWPPP) is required "whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwaters, or municipal separate storm sewer systems"(National Pollutant Discharge Elimination System [NPDES] General Permit, Construction Activity). Additionally, if implementation of the SWPPP results in insufficient reduction of sediment-laden storm water runoff leaving the site, the Trust will prepare and implement the necessary amendment within a timely manner or at the most, within 14 days.

All amendments to the SWPPP must be documented. The amendments are used to document the specific amendment, describe the purpose of the amendment, who was responsible for the amendment and their contact information. All amendments shall be dated and directly attached to the SWPPP.

# APPENDIX A

# STORM WATER POLLUTION PREVENTION PLAN

Commissary/PX Study Area
Presidio of San Francisco, California

## A.1 INTRODUCTION

Geomatrix Consultants, Inc. (Geomatrix) has prepared this Storm Water Pollution Prevention Plan (SWPPP) for the Commissary/Post Exchange (PX) Study Area (the Study Area) at the Presidio in San Francisco, California on behalf of the Presidio Trust (Trust). This SWPPP was prepared in accordance with the provisions of the State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities (General Permit). The Trust, with approval by the California Regional Water Quality Control Board—San Francisco Bay Region (RWQCB) have agreed to proceed with the implementation of the Phase 1 CAP Work Plan (Geomatrix, 2006) to implement the corrective action recommended in the *Revised Final Corrective Action Plan for the Commissary/Post Exchange Study Area* (Final CAP, Treadwell & Rollo [T&R], 2006).

The Trust will file a Notice of Intent (NOI) with the State Water Resources Control Board in advance of contractor mobilization. As discussed in the Final CAP and Phase 1 CAP Work Plan, Phase 1 corrective action will include soil removal from all impacted areas located within Area A (managed by National Park Service [NPS]) and portions of Area B (managed by the Trust) within an approximate150–foot buffer zone along the Crissy Field Marsh shoreline. The objective of the corrective action within the Phase 1 Area is to address petroleum-affected soil that potentially poses a threat to Crissy Field Marsh and land uses within Area A.

The provisions of this SWPPP will apply during construction activities during implementation of the Phase 1 CAP Work Plan (soil removal/construction) and for a limited period of time afterwards until a Notice of Termination (NOT) has been submitted by the Trust.

### A.1.1 SITE HISTORY/BACKGROUND

The Presidio is located at the northern tip of the San Francisco peninsula (Figure A-1). It occupies approximately 1,491 acres and is bounded by San Francisco Bay on the north and the

Pacific Ocean on the west. Densely populated residential areas of San Francisco border the Presidio to the south and east. The Presidio was a U.S. Army (Army) installation from 1848 through 1994, serving as a mobilization and embarkation point during several overseas conflicts, a medical debarkation center, and a coastal defense for the San Francisco Bay area. Industrial operations formerly performed at the Presidio are associated with maintenance and repair of vehicles, aircraft, and base facilities. The Presidio also contains a number of landfills used by the Army for the disposal of municipal waste and construction debris.

The Study Area is situated at the northern end of the Presidio, and generally lies between Mason Street and Doyle Drive (U.S. Highway 101; Figure A-2). Prior to the development of the Commissary and PX, the Study Area housed a number of Army structures, which no longer exist, as part of the Motor Pool. Reviews of historical records, aerial photographs, interviews, and site reconnaissance have identified approximately 30 structures that were present in the Study Area. These structures were used at various times to store supplies, equipment, and fuels to service and maintain vehicles for the Presidio. Additionally, numerous underground storage tanks (USTs) and above ground storage tanks (ASTs), fuel dispensers, and associated conveyance pipelines were reported active at various times between 1900 and 1984 (IT Corporation [IT], 1998). The Motor Pool was demolished in 1984.

### A.1.2 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTIONS

Historical activities in the Study Area resulted in petroleum hydrocarbon releases that were characterized in the Site Investigation (SI) and documented in the SI Report (T&R, 2003). In addition to the identified petroleum releases, four Study Area sites were associated with releases of hazardous substances as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Planned remedial actions for these four CERCLA sites have been documented in a Draft Remedial Actio Plan (MACTEC, 2004) and remediation for CERCLA sites will be addressed independently but in coordination with the actions described in the Phase 1 CAP Work Plan.

Several past corrective actions have been conducted in the Study Area to address various petroleum hydrocarbon releases, including:

- Building 626 waste oil UST removal;
- Building 603 UST removal;

- FDS-1 UST (Building 617) removal;
- FDS pipeline to FDS-1 removal (pipeline BR6-5);
- Contingency Site 171199-1100 and the Commissary Seeps Interim Source Removal Action;
- FDS pipelines CF-3, CF-4, and CF-12; and
- Contingency Site 111098-1100.

Results from these previous corrective actions are summarized in the Final CAP (T&R, 2006).

### A.1.3 CORRECTIVE ACTIONS AND SITE DEVELOPMENT

During implementation of the Phase 1 CAP Workplan, contaminated soil will be removed from all portions of the Study Area within Area A and portions of Area B located within approximately 150 feet of the present boundaries of Crissy Field Marsh shoreline (i.e., TPHg Source Area, the northern portion of Building 626 RU, and Fuel Distribution System (FDS) Pipeline Residuals Areas 1, 2 and 3 with AST 634 Area; Figures A-3A and A-3B).

The Phase 2 corrective action will occur within the remainder of the Study Area. Phase 2 will commence following decisions regarding the potential expansion of the Crissy Field Marsh into the Phase 2 Area. During Phase 2, soil will be removed from RUs located within the Phase 2 Area consistent with land use decisions, subject to RWQCB approval. If the Crissy Field Marsh is expanded into the area, cleanup will be conducted to protect the marsh and human land use, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup may be conducted to protect the anticipated land use (i.e., recreational use). These cleanup decisions will be made in consultation with the RWQCB prior to implementation of the Phase 2 corrective actions. The Trust will proceed with Phase 2 corrective actions work no later than the end of 2008.

This SWPPP addresses corrective actions that will be implemented during Phase 1. The Trust will prepare a separate SWPPP, if required, prior to implementation of the Phase 2 corrective actions.

### A.1.4 REGULATORY BACKGROUND

Implementation of the Phase 1 CAP Work Plan will involve disturbing more than one acre and is therefore required to comply with the Construction General Permit regulations that stipulate development and implementation of a SWPPP. To comply with the General Permit, the Trust will submit a Notice of Intent (NOI) to discharge storm water to the State Water Resources Control Board prior to commencement of remedial construction activities at the site.

## A.2 STORM WATER SOURCE IDENTIFICATION

The Study Area is relatively flat with elevated terrain south of Doyle Drive and southwest of the southwest corner of the Study Area (see topography shown on Figure A-2). The southern perimeter of the Study Area is adjacent to the Doyle Drive elevated structure. Numerous storm drain discharge pipes from the Doyle Drive structure drain onto the ground surface immediately beneath Doyle Drive. Several storm water catch basins are located throughout the parking lot areas, building landscaping, and on Mason and Halleck Streets (Figure A-2). Based on topography and observations during a December 31, 2005 and January 2, 2006 storm event, it appears that general surface water runoff in the Study Area drains in a northerly direction or to adjacent storm drain catchbasins. Generalized surface storm water flow directions are shown in Figure A-2. The storm drain catch basins in the Commissary area drain to Crissy Marsh.

## A.3 POTENTIAL SOURCES OF POLLUTION

This section discusses the potential pollutants and source areas that have potential to pollute storm water runoff during implementation of the Phase I CAP Work Plan.

### A.3.1 CHEMICALS OF CONCERN IN SOIL

Excavated soil is expected to be impacted by several chemicals of concern (COC) as identified in the CAP. Chemicals in soil that exceed cleanup levels were retained as COCs and include total petroleum hydrocarbons (TPH) quantified as gasoline (TPHg), diesel (TPHd) and fuel oil (TPHfo), benzene, the following six polycyclic aromatic hydrocarbons (PAHs): benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, and the following six metals: cadmium, chromium, copper, lead, nickel, and zinc. As discussed in the Phase 1 CAP Workplan, excavated soil may be temporarily stockpiled on-site for characterization prior to off-site disposal. Handling of stockpiled soil is described in Section A.4.2.

### A.3.2 STORM WATER POLLUTANT DISCHARGES

Sources of storm water pollutants at the Study Area include:

- Staging and equipment storage area: Earth moving equipment such as loaders and excavators will be brought on site during construction activities. Trucks and other equipment will be parked within active excavation areas or in staging area identified in the Phase 1 CAP Work Plan (Figures A-4A and A-4B). Equipment related leaks can occur from the rupture of any of the liquid reservoirs (fuel, crankcase oil, gearbox oils, hydraulic oils, or radiator coolant) or associated piping on individual pieces of equipment.

- Excavation and construction activities: Excavation activities have the potential to release soil that may be impacted with petroleum hydrocarbons, metals, and PAHs.

- Stockpile storage area: Soil may be temporarily stockpiled in the areas designated in the Phase 1 CAP Work Plan (Figures A-4A and A-4B). Soil stockpiles have the potential to release soil that may be impacted with petroleum hydrocarbons, metals and PAHs.

Confirmation sampling will be performed to ensure that soil left in place meets applicable cleanup levels presented in the CAP.

### A.3.3 NON-STORM WATER DISCHARGES

Based on previous investigations, depth to groundwater at the Study Area is estimated to be approximately 3 to 4 feet below ground surface (bgs) and since some of the petroleum-impacted soils extend to a depth of 10 feet bgs, dewatering will be required. Groundwater will be stored in tanks and then sampled and discharged to the sanitary sewer under a permit with the SFPUC as described in the Phase I CAP Work Plan.

Water trucks using potable water may be used for dust control measures, but the sprayed water will be absorbed into the soil. Excessive dust control spraying will be prohibited.

As stated in the General NPDES permit, there will be no non-storm water discharges occurring at the site.

## A.4 EROSION, SEDIMENT AND POLLUTANT CONTROL PRACTICES

This section describes practices that will be implemented to control erosion and pollution of storm water.

### A.4.1 GENERAL PRACTICES

Best management practices (BMPs) to be used at the Study Area are shown on the Excavation/Erosion Control Plan presented in Figures A-3A and A-3B and Work Plan Area/Erosion Control Plan presented on Figures A-4A, and A-4B. Erosion and sediment control practices that will be implemented at the site after construction has been completed is presented on the Final Erosion Control Plan (Figures A-5A and A-5B). These practices conform to the recommendations described in the Association of Bay Area Governments (ABAG) publication *Manual of Sediment and Erosion Control Measures* (ABAG, 1995), the RWQCB's *Erosion and Sediment Control Field Manual* (RWQCB, 1999) and information on the California Stormwater Quality Association website http://www.cabmphandbooks.com/Construction.asp. BMPs such as engineering controls, scheduled inspections, maintenance, employee training, and other management activities will be implemented to reduce the potential for pollutants to enter storm water.

### A.4.2 PRACTICES TO CONTROL SEDIMENT AND EROSION ONSITE

The Contractor will construct and maintain soil staging facilities at the Site for stockpiling excavated material. The excavation areas are shown on Figures A-3A and A-3B. Proposed locations for the soil staging facilities are shown on Figures A-4A and A-4B and include an existing asphalt pad located west of Building 610 and existing asphalt parking areas east of Building 610. The soil staging facilities will be constructed with a 10-mil HDPE bottom liner over the existing asphalt with the sides bermed with K-rails and certified weed and seed free straw wattles. Stockpiled material in the soil staging facilities will be covered with weighted 10-mil polyethylene sheeting during periods when material is not going to be added or removed.

Containment, storage, and disposal of free liquids and/or stabilization of excavated material in soil staging facilities will be performed, if required, so that the material is acceptable (i.e., no free liquids) for receipt by off-site disposal facilities. Materials used to stabilize the soil, if necessary, may include Portland cement or fly ash. Water that accumulates in soil staging areas will be collected, treated, and discharged along with water pumped directly from the excavation as described in Appendix C of the Phase 1 CAP Work Plan.

Specific practices that will be implemented to reduce the sediment load of storm water runoff from the Study Area include:

- Grading active work areas to prevent storm water from running from active work areas onto undisturbed areas.
- Installing storm water control devices (i.e., weed and seed free straw wattles and erosion control blankets, silt fences, and gravel bags) at the Study Area until vegetation is reestablished or the area is capped with landscaping material, pavement, or concrete;
- Sweeping streets adjacent to work areas on a regular (at least daily) basis;
- Protecting existing catch basins with silt fences or weed and seed free straw wattles; and
- Installing gravel bags on Mason Street (perpendicular to curb and sidewalk).

All straw wattles and erosion control blankets utilized on the project will be certified as weed and seed free. On completion of excavation and backfilling operations, the Study Area will be restored to pre-construction conditions (Figures A-5A and A-5B).

### A.4.3 PRACTICES TO CONTROL MIGRATION OF SEDIMENT OFFSITE

Prior to beginning work, the Contractor will establish a decontamination area at the Site in which dust, debris, and soil will be removed from equipment and transportation vehicles prior to leaving the Site. Decontamination methods may consist of brushing, vacuuming, steam cleaning, high-pressure washing, or combinations of the above. If water is used for decontamination, the water will be collected and managed along with excavation dewatering water as described in Appendix C of the Phase 1 CAP Work Plan.

### A.4.4 WIND EROSION AND DUST CONTROL

The Contractor will establish an effective means of dust control to minimize the generation of dust associated with excavation activities, truck traffic onto and off the Study Area, and the effects of ambient wind. Dust control measures may include the following:

- Keeping vehicle speeds on unpaved surfaces below five miles per hour;
- Misting or spraying water while excavating soil and loading soil into trucks;
- Controlling excavation activities and excavation rates to minimize dust generation;
- Keeping drop heights to a minimum, while loading soil into trucks;

- Using dust suppressant additives in the water; and
- Covering soil stockpiles.

If visible dust is observed, immediate steps will be taken to eliminate it. These steps will include increasing the intensity of dust control activities. If, after increasing dust control activities visible dust is still being generated, excavation or loading activities will be stopped until a plan for further dust control measures is developed.

### A.4.5 MANAGEMENT PRACTICES FOR CONSTRUCTION VEHICLES AND EQUIPMENT

The contractor for the construction site will conduct activities in conformance with the following guidelines to minimize vehicle/equipment contact with storm water.

Minor spills such as fuel from vehicles or other heavy equipment will be bermed with soil and cleaned using dry absorbent materials. If it is raining, the spill will be covered to avoid runoff. The contractor will be responsible for proper disposal of all wastes associated with spill cleanup. The following practices will be used during equipment and vehicle maintenance, vehicle fueling, and washing of construction vehicles.

**Equipment and Vehicle Maintenance**

- All construction equipment will be maintained to prevent oil or other fluid leaks.
- Vehicles and equipment will be kept clean; excessive buildup of oil and grease will be prevented.
- Off-site repair shops will be used.
- Spill cleanup materials will be kept readily accessible.
- On-site vehicles and equipment will be regularly inspected for leaks; repair immediately.
- Incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) will be checked for leaking oil and fluids. Leaking vehicles or equipment will not be allowed onto the site.
- Wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids will be segregated and recycled.

**Fueling**

- If fueling occurs on-site, the contractor will use designated areas away from drainage.
- Fuel for construction equipment may be provided by an on-site tank or by a mobile refueling vehicle.
- If an on-site tank is used, it will be double contained and located in a lined berm designed to hold the tank volume.
- Secondary containment, such as a drain pan or drop cloth, will be used to catch spills or leaks when removing or changing fluids.
- Drip pans will be used for any oil or fluid changes.

**Washing**

- Designated, bermed wash areas will be used during vehicle washing to prevent waste water from flowing into catch basins and other water bodies.
- Phosphate-free biodegradable soaps will be used.

### A.4.6 MANAGEMENT PRACTICES FOR MATERIALS AND CHEMICAL STORAGE

Chemicals will be stored in their original containers and will be clearly labeled at all times. If chemicals must be stored at the site, secondary containment, such as earth dikes or a surrounding berm, will be provided. Drums will be covered, whenever possible. If drums must be kept uncovered they will be stored at a slight angle to reduce corrosion and ponding of rainwater on the lids.

Loading and unloading of materials will occur at the specified locations where they will be used. Should prolonged storage of materials be required, a specific location for loading and unloading will be identified and noted on the Work Plan Area/Erosion Control Plan, at the time it is needed. Materials will be bundled and stacked neatly. Erosion control measures will be implemented to reduce storm water pollution from these areas.

Concrete/asphalt debris stockpiled on site will be collected and stored in designated location(s), and will not be mixed with other construction debris. Concrete debris and asphalt will be recycled, as appropriate.

Miscellaneous waste will be picked up weekly around the construction site. Specific areas targeted for pick-up will include erosion control devices, where waste will tend to collect.

### A.4.7 SITE PERSONNEL CONTROL

All contractors and subcontractors will sign the SWPPP acknowledging that they will comply with the SWPPP.

## A.5 STORM WATER MONITORING PROGRAM

The purpose of this storm water monitoring program is to ensure compliance with the General Permit and to evaluate the effectiveness and proper implementation of onsite BMPs in limiting the discharge of pollutants to storm water runoff.

### A.5.1 TRAINING

Project Management and supervisory personnel shall be familiar with this SWPPP and trained in inspection requirements and the actions necessary to implement BMPs in this SWPPP and in the required inspection and reporting requirements. The general contractor will conduct site orientation classes related to storm water pollution prevention for all personnel, including subcontractors. All superintendents and foremen should be aware of storm water pollution prevention management practices, and understand the contents of this SWPPP and the General Permit, and their implementation strategies. This SWPPP will be onsite for reference with Trust PM.

Training will be conducted as appropriate on an ongoing basis to remind all personnel of the SWPPP. All maintenance, repair, monitoring, reporting, and inspection requirements of the SWPPP shall be conducted by trained personnel. The names and signatures of persons who have been trained in the required inspection and reporting requirements for the project will be kept with this SWPPP.

### A.5.2 SITE INSPECTION PROCEDURES

Experience Trust or Geomatrix staff will conduct periodic inspections of the storm water system BMPs described in Section A.4.0 and the potential sources of pollution described in Section A.3.0. Inspections will be conducted to evaluate BMP effectiveness and to implement repairs or design changes. The inspection data will be reviewed to determine if any changes are required to maintain compliance with the conditions of the General Permit. Inspections will be performed by Trust or Geomatrix staff familiar with this SWPPP and experienced in the identification of non-compliance activities. Inspectors will have the authority to take corrective actions, if required.

To meet the requirements of both the SWPPP and General Permit, a minimum of one inspection per month is required. During dry periods, inspections should occur monthly. During storm events, inspections are to occur before and after each storm event and once each 24-hour period during extended storm events.

The name and contact information for the personnel responsible for conducting site inspections will be kept with the SWPPP during the project. In addition, records of all inspections, findings, and resulting actions will be kept on-site during the work.

### A.5.3 STORM WATER SAMPLING

Sampling and analysis is required when non-visible pollutants have the potential to contact storm water and run off the construction site into a storm drainage system or water body at levels that may cause or contribute to exceedance of a water quality standard. If any of the following conditions occur, the impacted storm water discharge will be sampled for non-visible pollutants:

- Construction materials and compounds are stored or applied such that they may come in contact with storm water.
- A leak or spill occurs that is not fully contained and cleaned prior to a storm event.
- A leak or spill occurs, during a storm event, and it cannot immediately be isolated and/or cleaned-up, and the possibility of an off-site discharge exists.

Depending on the potential pollutants involved and potential impact to storm water, one or more of the following analytes may be analyzed for in the discharge:

- TPHg, TPHd and/or TPHfo by EPA Method 8015/EPA 3630A;
- BTEX and MTBE by EPA 8021B or 8020;
- Total cadmium, chromium, copper, lead, nickel, and zinc (EPA 6010-6020);
- PAHs by EPA 8270C SIM; and
- Any other pollutants that are identified as having a potential impact to storm water.

### A.5.4 REPORTING AND RECORD KEEPING

#### A.5.4.1 Noncompliance Reporting

All instances of noncompliance with this SWPPP and General Permit must be reported to the RWQCB by telephone as soon as possible, but no later than 48 hours after the discharge has been discovered. A written report should be sent to the RWQCB within 14 calendar days of violation. Noncompliance reports should include:

- Type(s) of noncompliance; nature and cause of water quality standard exceedance.
- The BMPs currently being implemented.
- Description of actions undertaken and/or necessary to achieve compliance; any additional BMPs which will be implemented to prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards; any maintenance or repair of BMPs.
- Estimated implementation schedule for corrective actions.

The SWPPP and monitoring program will be revised promptly following issuance of non-compliance report to the RWQCB.

#### A.5.4.2 Record Keeping

The Trust will maintain all storm water inspection forms and training documentation as well as monitoring reports and noncompliance reports. Amendments will be made to this SWPPP and figures as major changes in site activity take place. These records will be included within the CAP Implementation Report.

## A.6 SPILL PREVENTION, CONTROL AND REPORTING

All spills will be reported to the proper local, state, and federal authorities pursuant to all applicable laws and regulations. On-site personnel should not attempt to control major spills. A written report should be sent to all notified authorities.

## A.7 POST-CONSTRUCTION EROSION AND STORM WATER MANAGEMENT

Once excavations have been backfilled, the Contractor will construct pavement sections consisting of six-inches of compacted aggregate road base below four-inches of asphalt concrete within Mason Street and the Contractor will place six-inches of compacted aggregate road base below two-inches of asphalt concrete within the Mason Street bicycle path and light-

use parking and drive areas. The Contractor also will replace curbs, gutters and utility vaults damaged or removed during the work and restore and re-stripe pavement areas.

The Trust will restore topsoil and vegetation in unpaved areas affected by the work. Top soil and vegetation affected by excavations or vehicle traffic in unpaved areas within Area A will be restored in accordance with NPS requirements. If seeding is used for restoration in the grassy area, weed and seed free erosion control blankets will be used. If sod is used to replace the vegetation in the grassy area, erosion control blankets will not be used. Anticipated post-construction BMPs are shown on Figure A-5A and A-5B; these figures should be revised during implementation, if necessary. These measures will be maintained by the Trust and/or NPS until the vegetation has matured to such a degree that artificial erosion control measures are no longer required. After construction is complete and long-term, post-construction erosion control measures have been installed, the Trust will file a NOT under the General Permit. After the NOT has been filed, the Trust and/or NPS will inspect and maintain the erosion control features if needed.

## A.8 CONTACTS

**In case of emergency contact representatives of the (Contractor to be determined) construction management firm for the project and the Presidio Trust:**

| | | |
|---|---|---|
| Trust Contact: | Jennifer Yata | Office: (415) 561-4272<br>Cell: (415) 760-1865<br>Fax: (415) 561-2132 |
| Alternate: | Craig Cooper | Office: (415) 561-4259<br>Fax: (415) 561-2132 |
| Project Site Manager: | Jennifer Yata | Office: (415) 561-4272<br>Cell: (415) 760-1865<br>Fax: (415) 561-2132 |
| Alternate: | George Ford | Office: (415) 561-4292<br>Fax: (415) 561-2132 |

Address: 1750 Lincoln Boulevard
Post Office Box 29052
San Francisco, California 94129-0052

**Environmental support is provided by Geomatrix Consultants, Inc.:**

| | | |
|---|---|---|
| Site Engineer: | Michael Beck | Office: (952) 935-1010 x.209<br>Cell: (612) 810-2495<br>Fax: (952) 935-1254 |
| Project Manager: | Gary Foote | Office: (510) 663-4260<br>Cell: (510) 301-4201<br>Fax: (510) 663-4141 |
| Construction Oversight Manager: | Mark deWit | Office: (510) 663-4188<br>Cell: (510) 867-5194<br>Fax: (510) 663-4141 |

Address: 2101 Webster St, 12th Floor
Oakland, California 94612

## A.9 REFERENCES

Association of Bay Area Governments (ABAG), 1995, Manual of Standards for Erosion and Sediment Control Measures, Second Edition, May.

California Regional Water Quality Control Board (RWQCB), 1999, Erosion and Sediment Control Field Manual 3rd Edition, San Francisco Bay Region, July.

Geomatrix Consultants, Inc. (Geomatrix), 2006, Phase I Corrective Action Plan (CAP) Work Plan, The Presidio of San Francisco, San Francisco, California, April 26.

IT Corporation, 1998, Site Investigation Work Plan, Commissary/Post Exchange Study Area, Presidio of San Francisco, California, October.

MACTEC, 2004, Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Sites, Presidio of San Francisco, California, September. (Includes updates through April 2005).

Treadwell & Rollo, 2003, Draft Site Investigation Report Commissary/Post Exchange Study Area, Presidio of San Francisco, California, August.

Treadwell & Rollo, 2006, Revised Final Corrective Action Plan, Commissary/PX Study Area, Presidio of San Francisco, California, April 2006.

N

0 1,000 Feet

**COMMISSARY/PX**
**SITE LOCATION MAP**

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June 2006

FIGURE A-1

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Crissy Field
Tidal Marsh

Mason Street

150 ft.
Buffer

Halleck Street

Area A

Phase 1

Phase 2

Area B

Ponding

Doyle Drive

603

605

606

610

638

632

631

635

204

201

231

228

Explanation

- Surface Seep
- Study Area Boundary
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 Existing Structure and Identification Number
- General runoff flow direction based on observations made during storm events on December 31, 2005 and January 2, 2006.
- Area A/Area B boundary
- Effective Phase 1/Phase 2 boundary
- Storm drain catch basin
- Storm drain manhole

N

0 150 300 Feet

# SITE PLAN WITH PHASE 1 AND PHASE 2 EXCAVATION AREAS AND TOPOGRAPHY

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FIGURE A-2

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Area A

Crissy Field

FDS Pipeline Residuals Area 1

FDS Pipeline Residuals Area 2

FDS Pipeline Residuals Area 3 and AST 634 Area

Building 626 Area

Crissy Field Tidal Marsh

Unpaved Trail

Paved Bicycle Path

150 ft. Buffer

Mason Street

Phase 1

Phase 2

Area B

610

632

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.

2. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

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Explanation

- Silt fence cover for storm drain catch basin
- Storm drain catch basin
- Storm drain manhole
- Silt fence
- Surface Seep
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Extent of Phase 1 Impacted Soil
- Approximate Initial Phase 1 Excavation Extent

N

0 50 Feet

# PHASE 1 EXCAVATION/ EROSION CONTROL PLAN

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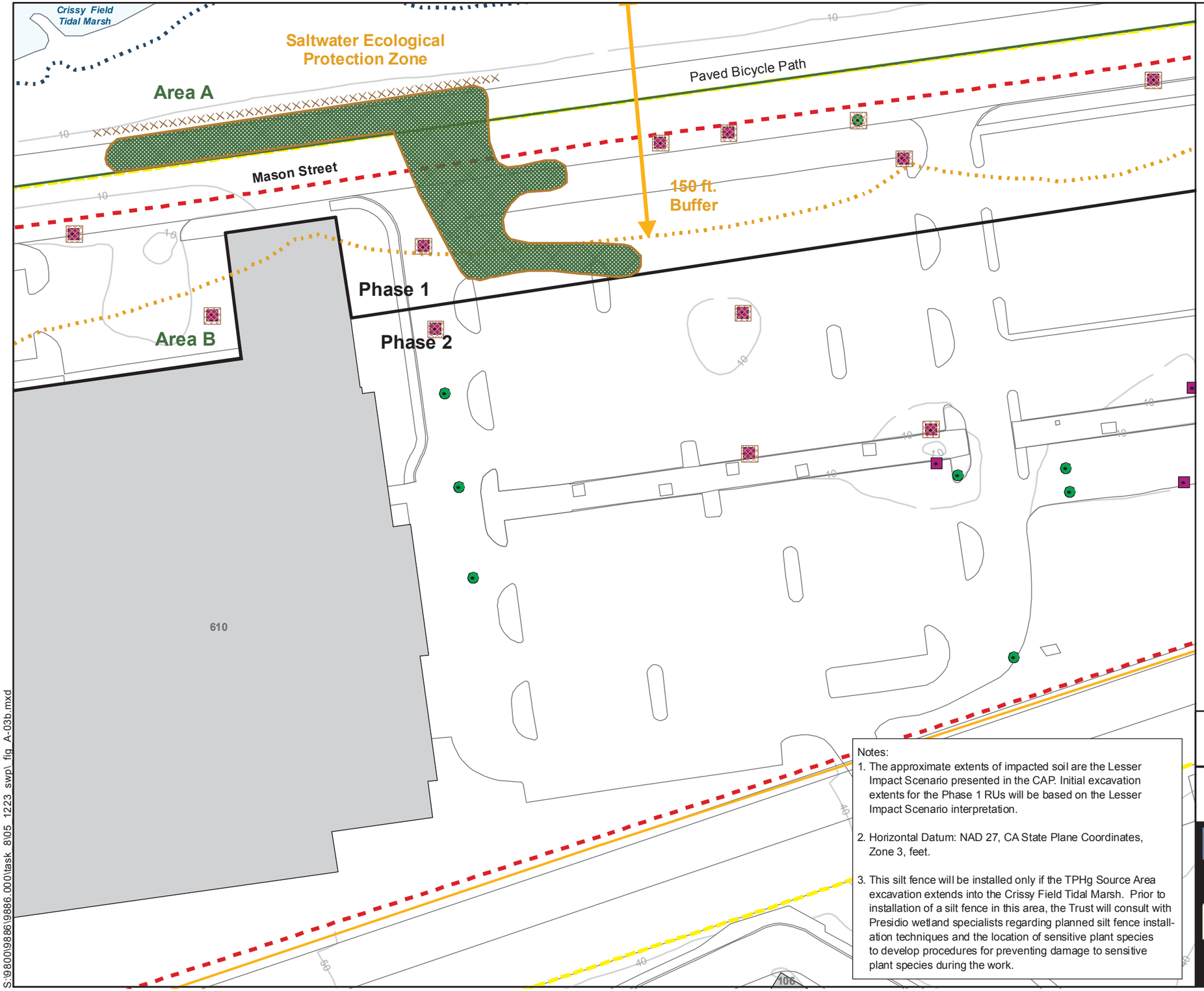
FIGURE A-3A




Explanation

- Silt fence cover for storm drain catch basin
- Storm drain catch basin
- Storm drain manhole
- Silt fence (see Note 3)
- Surface Seep
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Extent of Phase 1 Impacted Soil
- Approximate Initial Phase 1 Excavation Extent

N

0 60 Feet

Notes:

1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.
3. This silt fence will be installed only if the TPHg Source Area excavation extends into the Crissy Field Tidal Marsh. Prior to installation of a silt fence in this area, the Trust will consult with Presidio wetland specialists regarding planned silt fence installation techniques and the location of sensitive plant species to develop procedures for preventing damage to sensitive plant species during the work.

# PHASE 1 EXCAVATION/ EROSION CONTROL PLAN

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June 2006

FIGURE A-3B

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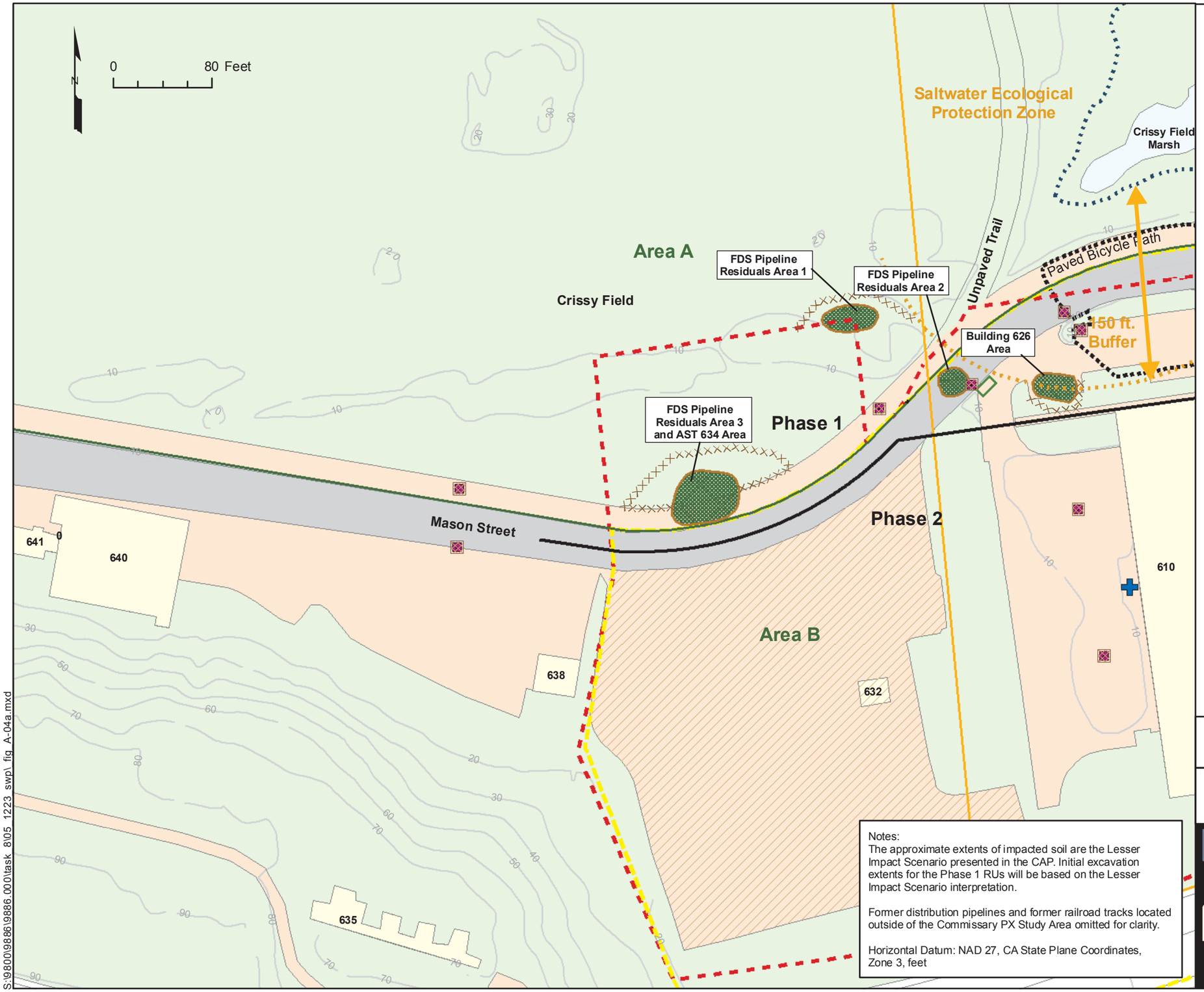


Explanation

- Silt fence cover for storm drain catch basin
- Storm drain catch basin
- Storm drain manhole
- Silt fence
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Initial Phase 1 Excavation Extent
- Unpaved Area
- Existing Building Area
- Light Use Asphalt Pavement Area
- Mason Street Asphalt Pavement Area
- Potential Dewatering Discharge Location
- Soil Stockpiling and Truck and Equipment Staging Area
- Approximate Extent of Phase 1 Impacted Soil

Notes:
The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.

Former distribution pipelines and former railroad tracks located outside of the Commissary PX Study Area omitted for clarity.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

# WORK PLAN AREA/ EROSION CONTROL PLAN

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FIGURE A-4A

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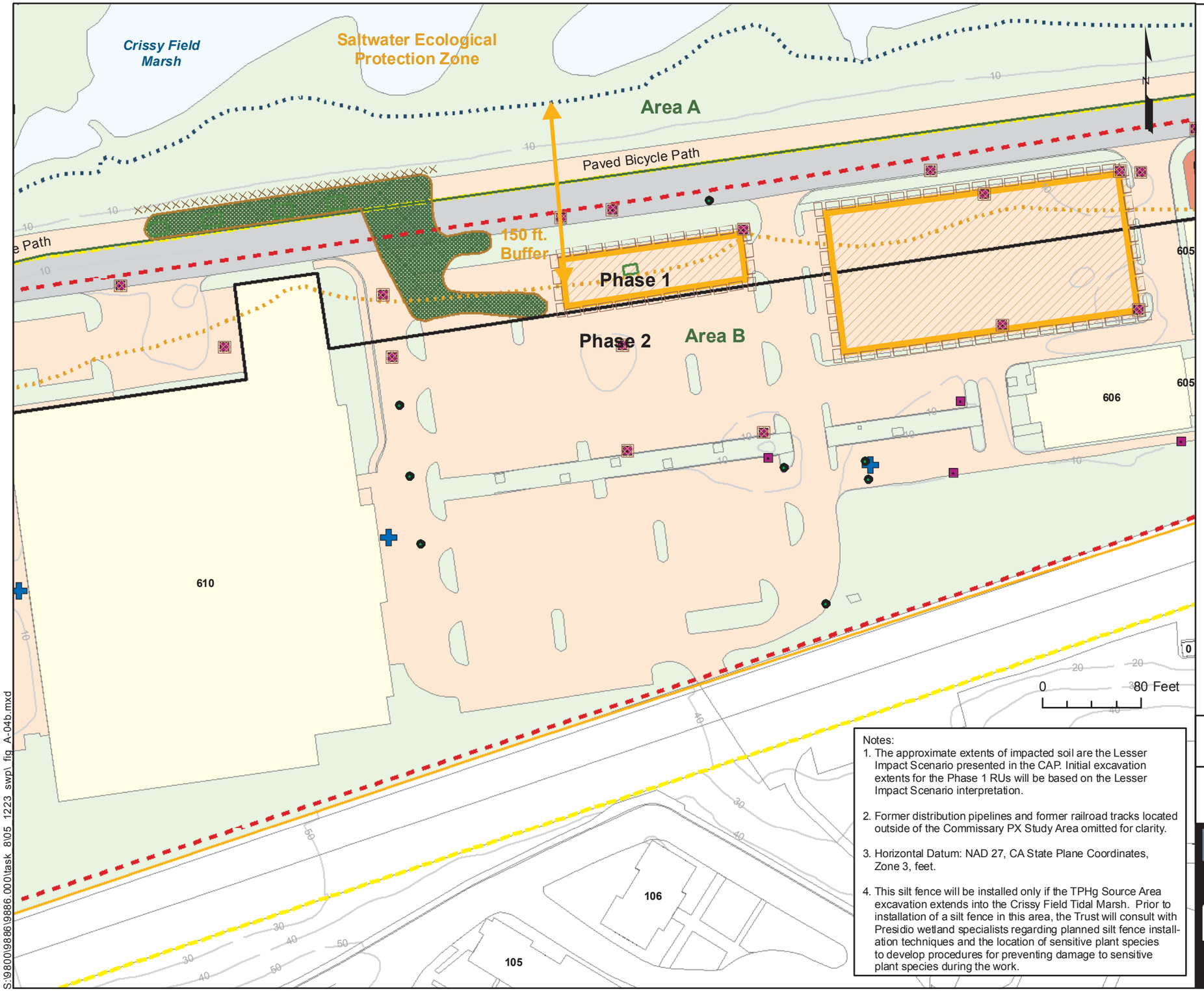


Explanation

- Silt fence cover for storm drain catch basin
- Storm drain catch basin
- Storm drain manhole
- Silt fence (see Note 4)
- Straw wattle
- K-Rails
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B Boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Initial Phase 1 Excavation Extent
- Unpaved Area
- Existing Building Area
- Light Use Asphalt Pavement Area
- Mason Street Asphalt Pavement Area
- Potential Dewatering Discharge Location
- Soil Stockpiling and Truck and Equipment Staging Area
- Approximate Extent of Phase 1 Impacted Soil

Notes:

1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Former distribution pipelines and former railroad tracks located outside of the Commissary PX Study Area omitted for clarity.
3. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.
4. This silt fence will be installed only if the TPHg Source Area excavation extends into the Crissy Field Tidal Marsh. Prior to installation of a silt fence in this area, the Trust will consult with Presidio wetland specialists regarding planned silt fence installation techniques and the location of sensitive plant species to develop procedures for preventing damage to sensitive plant species during the work.

# WORK PLAN AREA/ EROSION CONTROL PLAN

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FIGURE A-4B

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Area A

Crissy Field

FDS Pipeline Residuals Area 1

FDS Pipeline Residuals Area 2

FDS Pipeline Residuals Area 3 and AST 634 Area

Commissary Seeps Interim Source Removal Excavation (Summer 2001)

Crissy Field Tidal Marsh

Unpaved Trail

Paved Bicycle Path

150 ft. Buffer

Building 626 Area

Phase 1

Phase 2

Mason Street

Area B

610

632

Notes:
1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.

2. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

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Explanation

- Storm drain catch basin
- Storm drain manhole
- Surface Seep
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Extent of Phase 1 Impacted Soil*
- Approximate Initial Phase 1 Excavation Extent*
- Erosion control blanket**

*Final grades and surface features will match existing conditions

**Erosion control blankets will be used for seeding. If sod is used in a grassy area, erosion control blankets will not be used.

0 50 Feet

# PHASE 1 POST- CONSTRUCTION EROSION CONTROL PLAN

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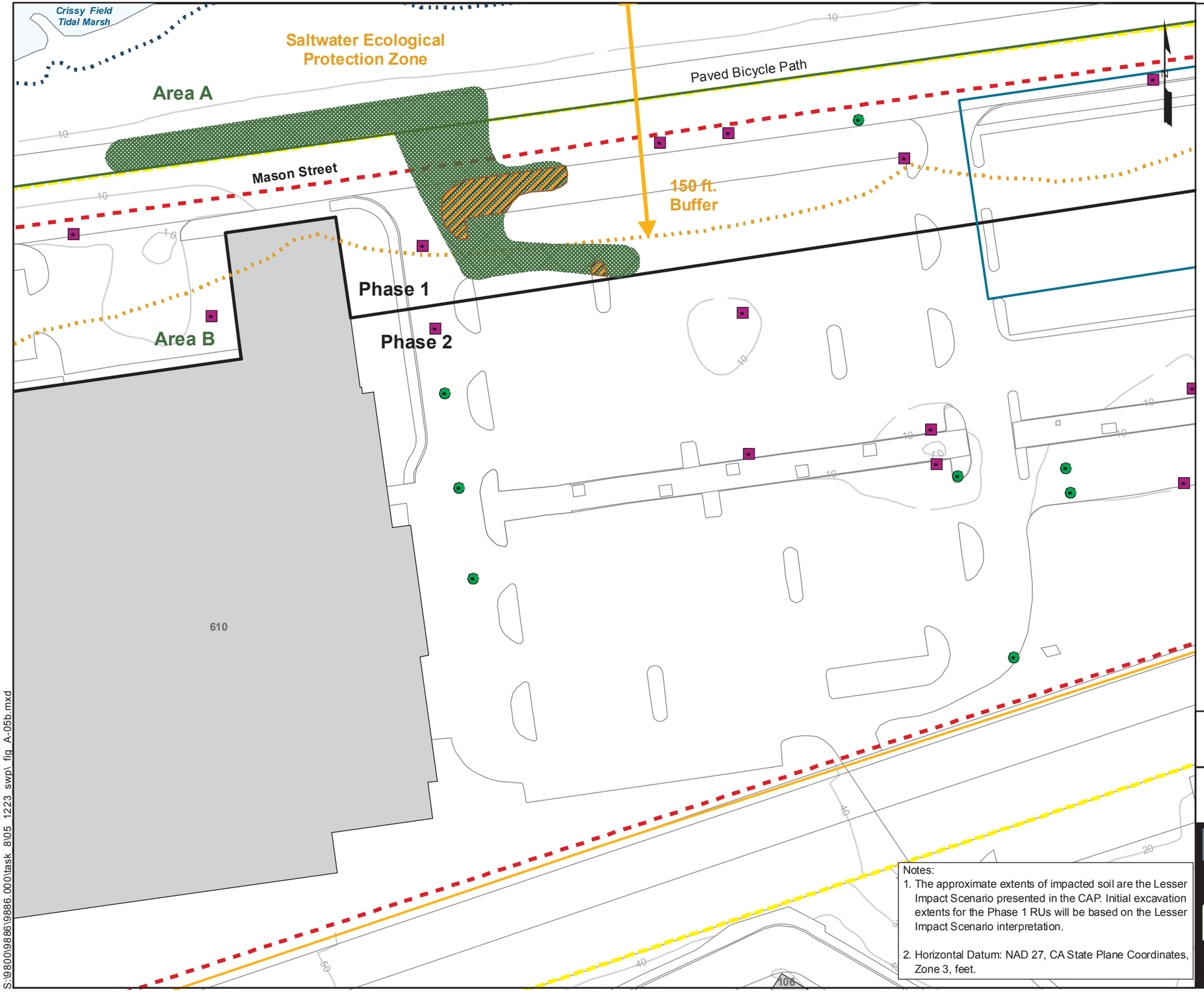
FIGURE A-5A




Explanation

- Rock
- Storm drain catch basin
- Storm drain manhole
- Surface Seep
- Effective Phase 1/Phase 2 Boundary
- Study Area Boundary
- Area A / Area B boundary
- Land Use Control Area
- Saltwater Ecological Protection Zone Boundary 9RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Mean Higher High Water Level (MHHW)
- Approximate 150 ft Buffer Zone
- 610 — Existing Structure and Identification Number
- Approximate Extent of Phase 1 Impacted Soil*
- Approximate Initial Phase 1 Excavation Extent*

* Final grades and surface features will match existing conditions

0 60 Feet

Notes:

1. The approximate extents of impacted soil are the Lesser Impact Scenario presented in the CAP. Initial excavation extents for the Phase 1 RUs will be based on the Lesser Impact Scenario interpretation.
2. Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet.

# PHASE 1 POST- CONSTRUCTION EROSION CONTROL PLAN

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June 2006

FIGURE A-5B

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# APPENDIX B
# Traffic Control Plan

# APPENDIX B

# TRAFFIC CONTROL PLAN
Commissary/PX Study Area
Presidio of San Francisco, California

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B.2 INFORMATIONAL SIGNS ..... B-2
B.3 TPHg SOURCE AREA ..... B-2
B.4 EXCAVATIONS WEST OF BUILDING 610 ..... B-3


## FIGURES


Figure B-1 Commissary/PX Study Area – Traffic and Signage Plan
Figure B-2 Bus Stop and Crosswalk Relocation Area
Figure B-3 Mason Street Realignment No. 1
Figure B-4 Mason Street Realignment No. 2
Figure B-5 Mason Street Realignment No. 3
Figure B-6 Mason Street Realignment No. 4

# APPENDIX B

# TRAFFIC CONTROL PLAN

Commissary/PX Study Area
Presidio of San Francisco, California

## B.1 BACKGROUND

This appendix presents the traffic and signage plan that will be used during implementation of a corrective action that will address petroleum-impacted soils at or near the Commissary/Post Exchange (PX) Study Area within the Presidio of San Francisco (Presidio). During the first phase (Phase 1) of work, petroleum impacted soils will be removed from the Commissary/PX Study Area in the vicinity of Mason Street. The study area is depicted on B-1. This appendix describes the purpose and location of signs that will be posted near work areas to inform the public of the purpose and schedule for the work and pedestrian, parking, and traffic restrictions that will be associated with the work.

As shown on Figure 2 of the Phase 1 CAP Work Plan, impacted soils are present below Mason Street and the associated paved pedestrian and bicycle path (Bike Path). Excavation will occur within the limits of Mason Street and the Bike Path for the TPHg Source Area excavation located north and east of Building 610 and for multiple excavation areas west of Building 610. Mason Street and the Bike Path will need to be temporarily rerouted to allow completion of the TPHg Source Area excavation and excavations west of building 610. In order to minimize impacts to the tenants of Building 610 and the public, excavation, backfilling, and Site restoration will be completed in phases. Although traffic will be temporarily diverted around active excavation areas, Mason Street will remain open throughout the project. The Trust will implement appropriate traffic control signage that is consistent with the Federal Highway Administration Manual on Uniform Traffic Control Devices, Revision 1, dated November 2004 (MUTCD). Stop signs will be placed on Mason Street east and west of active work areas when Mason Street traffic realignments are underway during excavation in the TPHg area. The Trust will submit the Traffic and Signage Plan to the Park Police and Fire Departments prior to beginning excavation activities.

To protect pedestrians and bicyclists on the Bike Path, all informational signs and warning signs placed along the Bike Path will be placed on the shoulder of Mason Street, if possible. In

addition, the signs will be equipped with flashing lights and will be constructed of a soft material (e.g., Coroplast®). A smooth and debris free surface will be maintained on the Bike Path and Mason Street bicycle lane throughout the project.

## B.2 INFORMATIONAL SIGNS

In consultation with NPS, the Trust will prepare signs explaining the purpose, extent, and approximate schedule of the impacted soil removal operations. The specific language for these signs will be developed during the Trust $N^2$ process and NPS project review. These signs will be prepared and installed by the Trust at the locations shown on Figure B-1. Signs will be placed on Mason Street just east and west of the work areas. A third sign will be placed on Bank Street below Doyle Drive to warn motorists traveling north on Bank Street (Young Street). A fourth sign will be placed on the unpaved pedestrian path west of the Crissy Field Marsh.

## B.3 TPHg SOURCE AREA

Pedestrian restrictions: During construction, active work areas will be completely fenced. To facilitate excavation of impacted soil, the Bike Path will be temporarily relocated during portions of the work. Pedestrian traffic on the Bike Path will be separated from vehicular/Bicycle traffic on routed alignments of Mason Street using physical barriers such as K-rails. During excavation of the TPHg Source Area, the Trust will relocate the bus stop and associated crosswalk and curb cut east of the work area. The bus stop and crosswalk relocation area is depicted on Figure B-2.

Parking and traffic restrictions: The northern portion of the Building 610 and Building 605 parking lots will be temporarily closed during the work to allow excavation and stockpiling of impacted soils. Cautionary signs will be placed on Mason Street and Bank Street to warn pedestrians, bicyclists, and motorists of the modified street alignment and the possibility of cross-traffic (Figure B-1). Flaggers will assist trucks and equipment entering and leaving the work areas.

To facilitate excavation of impacted soil below Mason Street, portions of Mason Street will be temporarily rerouted around active work areas. Vehicle speed limits on Mason Street may be temporarily reduced in the vicinity of the Site. If practical, two paved lanes with minimum widths of 12 feet will be maintained for Mason Street vehicular traffic during the project.

Flaggers will be present at all times during working hours, if motorists on Mason Street are diverted to roadway sections less than 24 feet in width. Flashing barricades, flashing signs, K-rails, and trench plates consistent with the MUTCD will be utilized to protect motorists traveling on roadway sections less than 24 feet in width during non-working hours. Motorists will be separated from active work areas with temporary chain-link fencing and physical barriers such as K-rails.

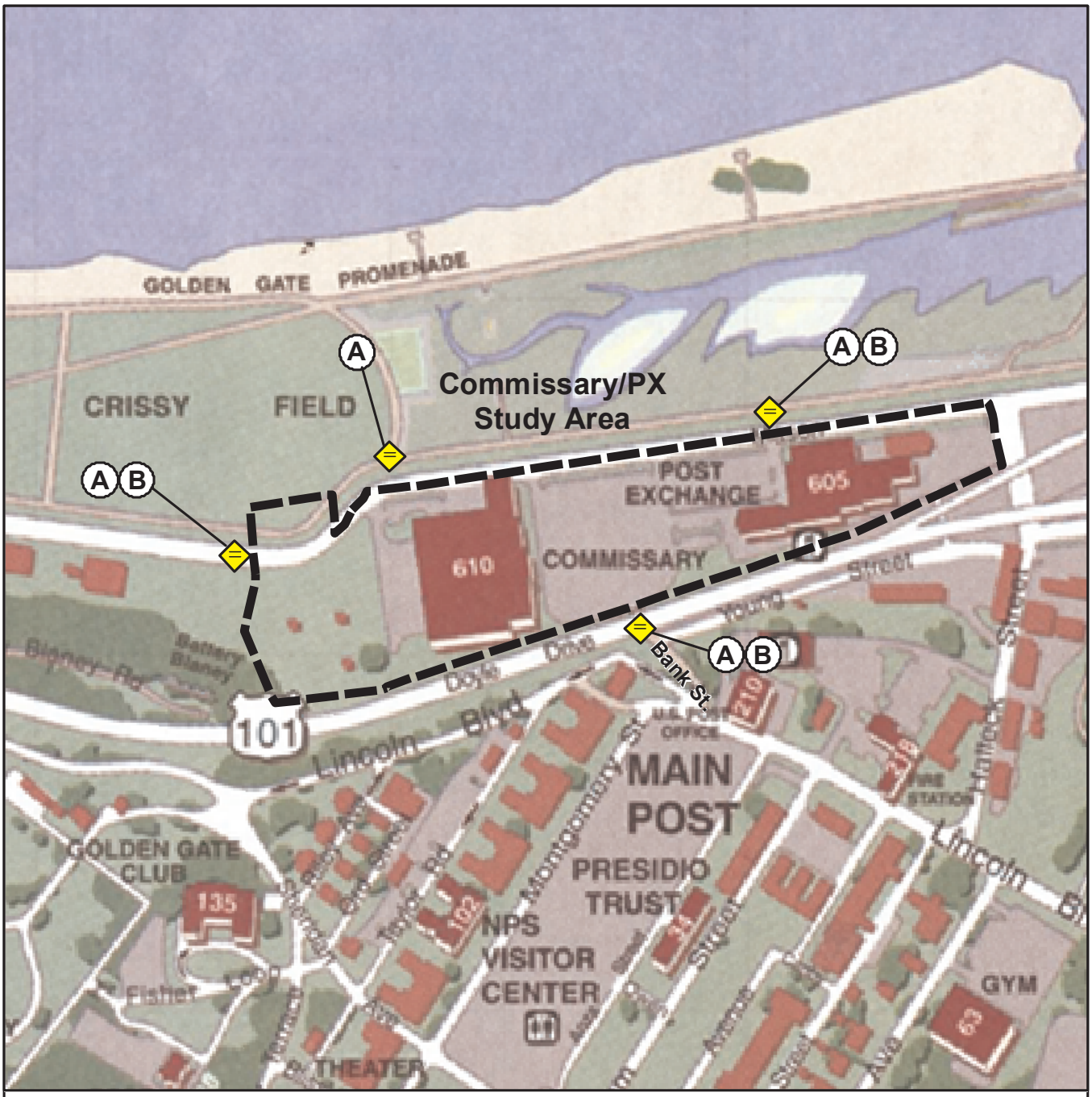
The planned temporary alignments for rerouting traffic, pedestrians, and bicycles during excavation of impacted soil in the TPHg area are depicted on Figures B-3, B-4, and B-5. These potential alignments are conceptual and may be modified based on the actual extent of impacted soil encountered during the work. The NPS will have an opportunity to review and provide input regarding modifications to the planned temporary alignments shown on Figures B-3, B-4, and B-5.

## B.4 EXCAVATIONS WEST OF BUILDING 610

Pedestrian restrictions: During construction, active work areas will be completely fenced. To facilitate excavation of impacted soil, the Bike Path will need to be temporarily rerouted during portions of the work. The portion of FDS Pipeline Residuals Area 3 and AST 634 Area located north of the Bike Path will be excavated prior to rerouting the Bike Path. During excavation of the southern portion of FDS Pipeline Residuals Area 3 and AST 634 Area, pedestrian and bicycle traffic on the Bike Path will be rerouted north of its current location. The planned location of the temporary Bike Path alignment is depicted on Figure B-6. The temporary Bike Path will be constructed with ¾-inch plywood with K-Rail barriers on both sides. The plywood will be covered with slip resistant paint. Cautionary signs and barriers consistent with the MUTCD will be placed and maintained to warn pedestrians and bicyclists of the temporary Bike Path alignment.

Parking and traffic restrictions: To facilitate excavation of impacted soil below Mason Street for FDS Pipeline Residuals Area 2, a portion of Mason Street will be temporarily relocated south of its current location. The planned temporary alignment for traffic and bicycles traveling on Mason Street is depicted on Figure B-4. Cautionary signs and barriers consistent with the MUTCD will be placed and maintained on Mason Street east and west of the work areas to warn motorists of the modified street alignment and the possibility of cross-traffic (Figure B-1). Flaggers will assist trucks and equipment entering and leaving work areas. The Contractor will maintain access for the Building 610 tenant to the paved support area

immediately west of Building 610. If excavation activities are required in the existing entrance for this area, the Contractor will construct a temporary roadway and entrance through the existing green space west of the support area.




Explanation

(A) Information sign describing purpose, extent, schedule (4 total)

(B) Series of signs along road:

**"Caution: Construction Ahead"**
**"Trucks Entering Roadway"**
**"Slow: Construction Zone"**
**"Caution: Flag Person Ahead"**

N

0 400 Feet

# COMMISSARY/PX STUDY AREA TRAFFIC AND SIGNAGE PLAN

Geomatrix

THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315

June 2006

FIGURE B-1

S:\9800\9886\9886.000\task_8\05_1221_capiwp_fig_B-01.mxd

Temporary asphalt accessibility ramps

Temporary crosswalk striping

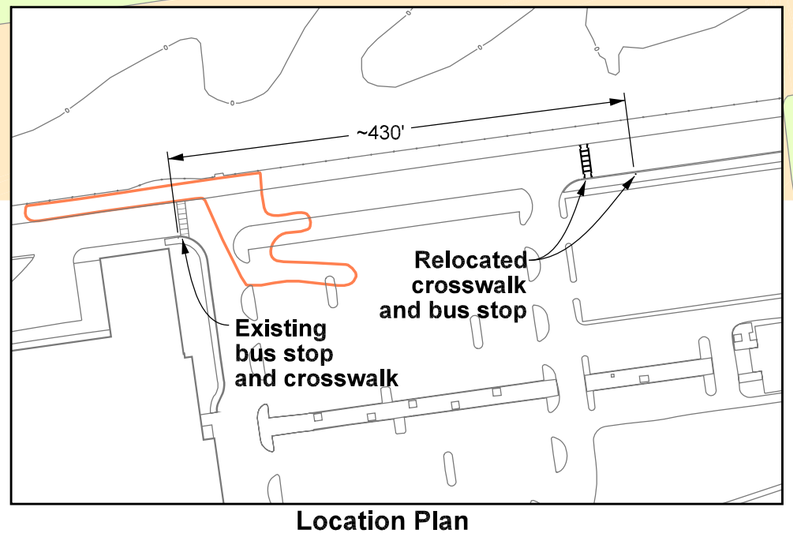
Existing bike lanes

10'

60'

Temporary bus stop

Divert bicyclist around temporary ramp




Location Plan

EXPLANATION

- Unpaved area
- Existing building area
- Light use asphalt pavement area
- Mason street asphalt pavement area

N

0 30

Scale in Feet

BUS STOP AND CROSSWALK RELOCATION AREA

Geomatrix

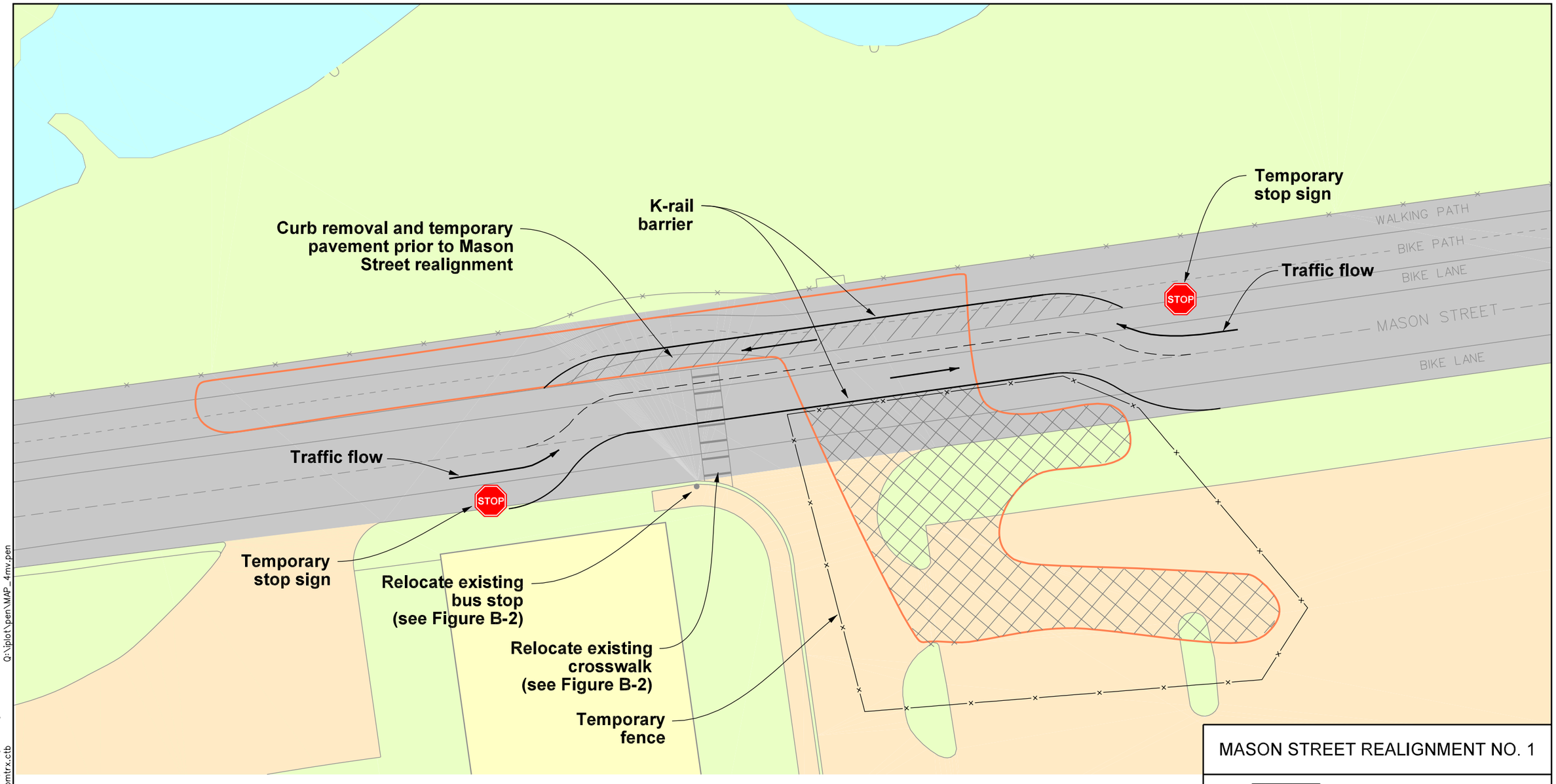
THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315

June 2006

FIGURE B-2

01-JUN-2006 14:36 swessels
S:\9800\9886\9886.000\task_8\05_1221_capiwp_fig_b-2.dgn Q:\iplot\ctb\geomtrx.ctb
\\OAKPRNT1\Splash_hold Q:\iplot\pen\MAP_4mv.pen




Note:

The Trust will relocate the existing bus stop, cross walk, and curb ramps east of the work area, and reinstate at current location at end of work.

EXPLANATION

- Approximate initial Phase 1 excavation extent
- Active work area
- Unpaved area
- Existing building area
- Light use asphalt pavement area
- Mason street asphalt pavement area

N

0 30

Scale in Feet

MASON STREET REALIGNMENT NO. 1

Geomatrix

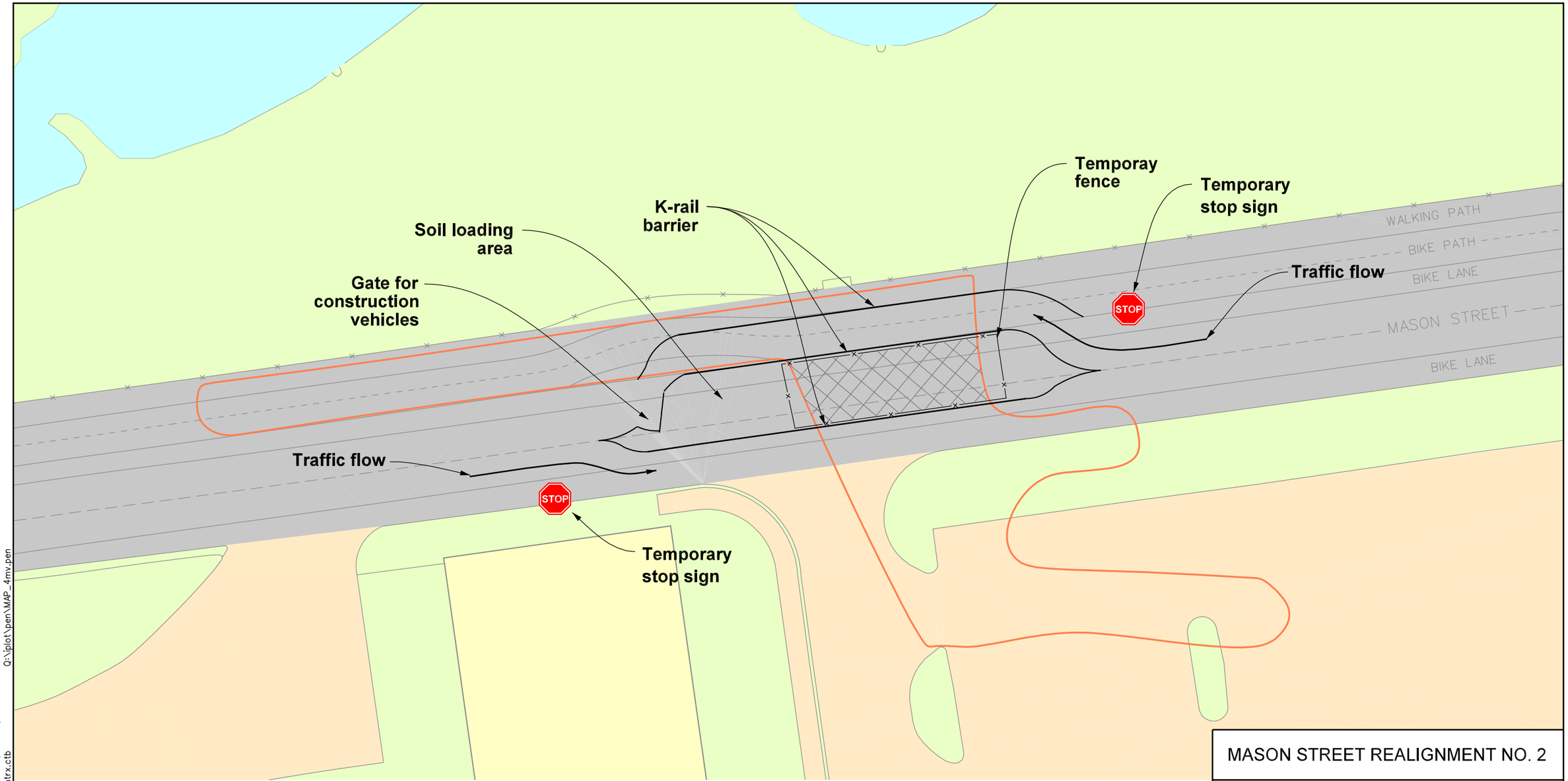
THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315

June 2006

FIGURE B-3

01-JUN-2006 14:36 swessels
S:\9800\9886\9886.000\task_8\05_1221_copiwp_fig_b-3.dgn
\\OAKPRNT1\Splash_hold Q:\iplot\ctb\geomtrx.ctb
Q:\iplot\pen\MAP_4mv.pen




EXPLANATION

- Approximate initial Phase 1 excavation extent
- Active work area
- Unpaved area
- Existing building area
- Light use asphalt pavement area
- Mason street asphalt pavement area

N

0 30

Scale in Feet

MASON STREET REALIGNMENT NO. 2

Geomatrix

THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315
June 2006

FIGURE B-4

01-JUN-2006 14:36 swessels
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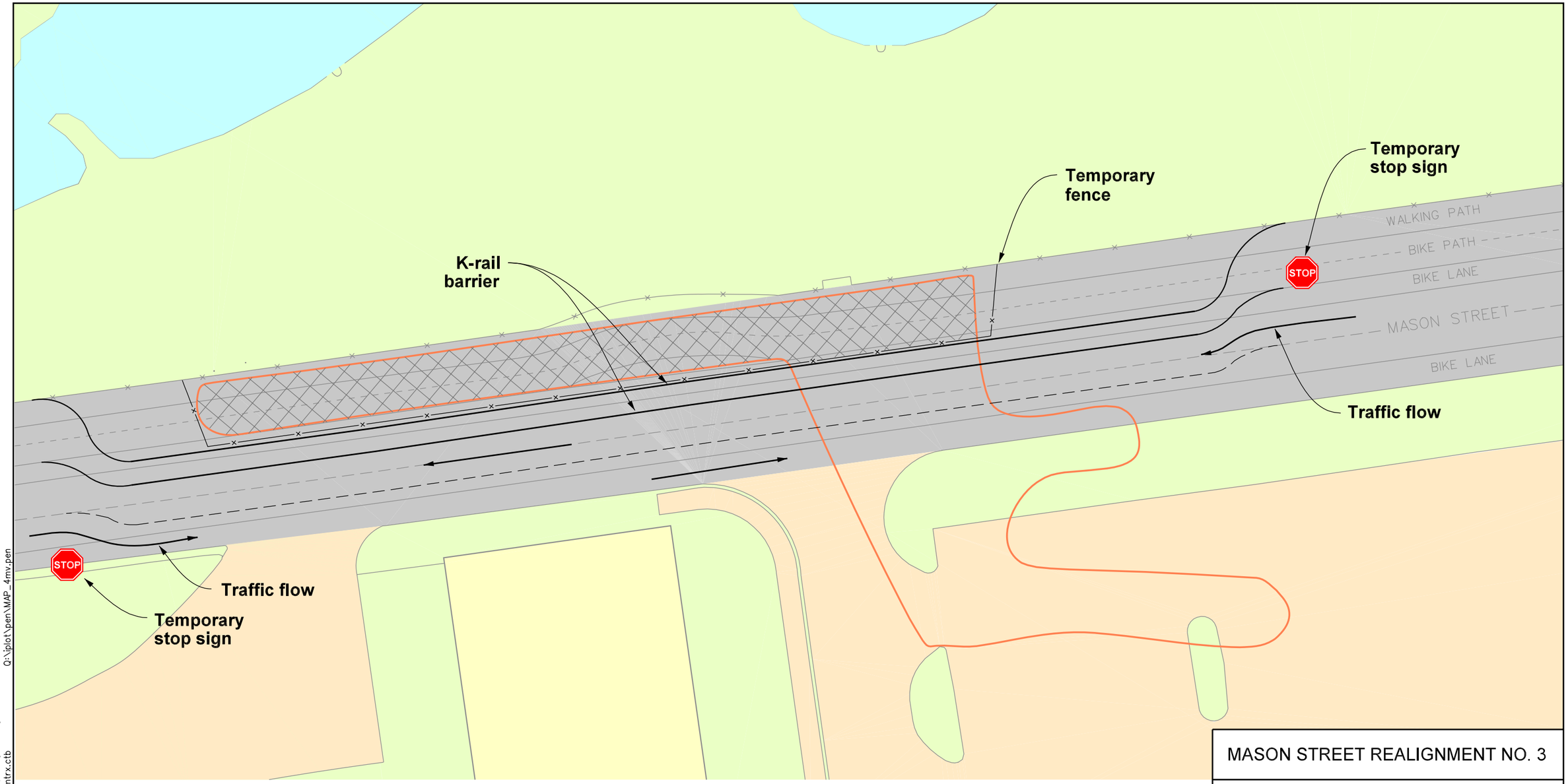
\\OAKPRNT1\Splash_hold Q:\plot\pen\MAP_4mv.pen




EXPLANATION

- Approximate initial Phase 1 excavation extent
- Active work area
- Unpaved area
- Existing building area
- Light use asphalt pavement area
- Mason street asphalt pavement area

N

0 30

Scale in Feet

MASON STREET REALIGNMENT NO. 3

Geomatrix

THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315

June 2006

FIGURE B-5

01-JUN-2006 14:37 swessels
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\\OAKPRNT1\Splash_hold Q:\plot\ctb\geomtrx.ctb
Q:\plot\pen\MAP_4mv.pen

Temporary stop sign

STOP

Traffic flow

K-rail barrier

Temporary fence

Diversion of path to be constructed of 10' x 4' x 3/4" plywood

K-rail barrier

WALKING PATH

BIKE PATH

BIKE LANE

MASON STREET

BIKE LANE

STOP

Temporary stop sign

Traffic flow

Temporary fence

New pavement

EXPLANATION

- Approximate initial Phase 1 excavation extent
- Active work area
- Unpaved area
- Existing building area
- Light use asphalt pavement area
- Mason street asphalt pavement area

N

0 40

Scale in Feet

MASON STREET REALIGNMENT NO. 4

Geomatrix

THE PRESIDIO TRUST

Presidio Trust
34 Graham Street
P.O. Box 29052
San Francisco, CA
94129-0052
415/561-5300
fax 415/561-5315

June 2006

FIGURE B-6

01-JUN-2006 14:37 swessels
S:\9800\9886\9886.000\task_8\05_1221_copiwp_fig_b-6.dgn Q:\iplot\ctb\geomtrx.ctb
\\OAKPRNT1\Splash_hold Q:\iplot\pen\MAP_4mv.pen

# APPENDIX C

# Groundwater Dewatering Plan

# APPENDIX C

# GROUNDWATER DEWATERING PLAN

Commissary/PX Study Area
The Presidio of San Francisco, California

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C.3 DEWATERING PLAN FOR PHASE I CAP IMPLEMENTATION ..... C-2
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- C.3.2 SAMPLING AND ANALYSIS ..... C-3
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C.4 REFERENCE ..... C-3


## ATTACHMENT


Attachment 1 Presidio Trust's San Francisco Public Utilities Commission Wastewater Discharge Permit

# APPENDIX C

# GROUNDWATER DEWATERING PLAN

Commissary/PX Study Area
The Presidio of San Francisco, California

## C.1 INTRODUCTION

This appendix presents the dewatering plan that will be used during implementation of a corrective action to address petroleum-impacted soils at or near the Commissary/Post Exchange (PX) Study Area (Study Area) within the Presidio of San Francisco (Presidio). During the first phase of work (Phase 1), petroleum impacted soils will be removed from the Commissary/PX Study Area in the vicinity of Mason Street. Dewatering will be required because some of the petroleum-impacted soils extend to a depth of 10 feet below ground surface (bgs), and the depth to groundwater is approximately 3 to 4 feet bgs. This appendix contains information from previous dewatering activities conducted by the Trust in the Study Area as a guide for the planned work and the dewatering plan for the Phase 1 corrective action.

## C.2 PREVIOUS DEWATERING ACTIVITIES

Previous dewatering activities were conducted by the Trust at the Site from March 2001 through June 2001 during excavation of petroleum-impacted soils for the Commissary Seeps Interim Source Removal Project (Commissary Seeps Excavation) (Treadwell & Rollo, 2002). A total of 305,500-gallons of water were pumped from the excavation using "open hole" dewatering techniques. Water was pumped directly from the open excavation when certain activities required access to the excavation and from bermed soil stockpile areas where water had collected. The water was discharged to the sanitary sewer under a permit with the San Francisco Public Utilities Commission (SFPUC).

Water from the excavation and water from the soil stockpile areas was stored in a series of aboveground tanks prior to discharge to the SFPUC sewer system. Water from the excavation was pumped through a 22,000-gallon weir tank that served both as an oil/water separator and a settling tank for suspended solids. Water from the weir tank was then temporarily stored in 22,000-gallon storage tanks. Water samples were collected from the storage tanks, and the results were compared to the SFPUC discharge limits, before discharging water to an on-Site manhole under the Trust's existing SFPUC Wastewater Discharge Permit. The concentration

of constituents detected in water samples from the Commissary Seeps Excavation were significantly below SFPUD discharge standards.

## C.3 DEWATERING PLAN FOR PHASE I CAP IMPLEMENTATION

Five separate areas will be excavated during implementation of the corrective action. The anticipated excavation depths for the five areas are listed below.

| Areas to be Excavated (from west to east) | Anticipated Excavation Depths (ft bgs) |
|---|---|
| 1. FDS Area 3/AST 634 | 3 |
| 2. FDS Area 1 | 3 |
| 3. FDS Area 2 | 3 |
| 4. Building 626 Area | 10 |
| 5. TPHg Source Area | 3-10 |

Based on the anticipated excavation depths, two excavations may require dewatering. However, the anticipated excavation depths are based on analytical results for soil samples collected from borings and wells drilled in the Site. The final excavation depths will be based on confirmation soil samples collected from the base of each excavation. Therefore, it is possible that an excavation could be deeper if confirmation soil samples exceed the soil cleanup levels.

Dewatering techniques similar to those used during the interim source removal action will be utilized during implementation of the corrective action. Excavations will be dewatered when access to the base of the excavation is required. These activities will include:

- Excavation of petroleum-impacted soils;
- Collection of confirmation soil samples;
- Surveying the excavation limits; and
- Backfilling the excavation.

When such an activity is completed, pumping will stop and the excavation will be allowed to refill with groundwater. In this manner, the total volume of water generated will be minimized. Water that collects in bermed on-Site soil stockpile areas will also be collected and stored on-Site.

### C.3.1 DISCHARGING DEWATERING WATER

The Trust maintains a SFPUC Wastewater Discharge Permit for discharging water generated during construction activities at the Presidio. Water pumped from excavations will pass through a weir tank that will serve both as an oil/water separator and a settling tank for suspended solids. Water will be discharged to the SFPUC sewer system through an on-Site manhole. Potential discharge locations are depicted on Figures 4a and 4b of the CAP Work Plan.

### C.3.2 SAMPLING AND ANALYSIS

The water will be temporarily stored in above-ground tanks before being discharged to the SFPUC sewer system. Water samples will be collected from the initial tank volume from each excavation where dewatering occurs. Water samples will be collected from the storage tank after the water has passed through the weir tank. The water samples will be collected by dipping a pre-cleaned bailer into the storage tank and pouring water into laboratory supplied sample containers. No confined space entry will be required for collecting these samples. Water samples will be analyzed for parameters required by the Trust's SFPUC Waste Discharge Permit (see Attachment 1). Samples of water drained from soil stockpile areas will be collected directly from the water storage tank. Water sampling results will be compared to the SFPUC's discharge limits before discharging the water.

### C.3.3 MAINTENANCE ACTIVITIES

The Contractor will clean the weir tank and storage tanks, as needed, during dewatering and will perform a final cleaning of the tanks when dewatering for the corrective action is complete. Rinse water from the tanks will be discharged to the SFPUC sewer system. The sediment from the tanks will be disposed at an off-Site facility along with the excavated soil.

## C.4 REFERENCE

Treadwell & Rollo, 2002. *Commissary Seeps Interim Source Removal Action Report*, Treadwell & Rollo, San Francisco, California, January 2002.

Geomatrix

# ATTACHMENT 1

# Presidio Trust's San Francisco Public Utilities Commission Wastewater Discharge Permit

SFPUC
WATER
HETCH HETCHY WATER & POWER
CLEAN WATER

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
Bureau of Environmental Regulation and Management
3801 THIRD STREET, SUITE 600, SAN FRANCISCO, CA 94124 - Tel. (415) 695-7310 - Fax (415) 695-7388

GAVIN NEWSOM
MAYOR

E. DENNIS NORMANDY
PRESIDENT

RICHARD SKLAR
VICE PRESIDENT

ANN MOLLER CAEN
ADAM WERBACH
RYAN L. BROOKS

SUSAN LEAL
GENERAL MANAGER

# PERMIT NO. 05-0246

## INDUSTRIAL USER CLASS II WASTEWATER PERMIT

Discharger: Presidio Water Treatment Plant
1773 Gibson Rd.
Presidio of San Francisco, CA 94129

SIC/ID: 4941/02008

Pursuant to the provisions of Sections 120, 124 and 125 of Chapter X (Public Works Code) of Part II of the San Francisco Municipal Code, Article 4.1 (hereinafter referred to as "Article 4.1"), it is hereby ordered that the above industrial user/permittee is authorized to discharge wastewater, from the indicated business address, into the City and County of San Francisco's (City's) sewerage system, provided that such wastewater discharges are performed through the facility's approved side sewer(s), and are in accordance with the conditions set forth in this **Class II Wastewater Permit.**

Compliance with this permit does not relieve the permittee of its obligation to comply with any or all applicable pretreatment regulations, standards or requirements under local, state and federal laws, including any such regulations, standards, requirements, or laws which may become effective during the term of this permit. Noncompliance with any condition of this permit shall constitute a violation of Article 4.1.

Effective date of permit: February 7, 2005
Re-application date: November 6, 2009
Expiration date of permit: February 6, 2010

By: _____
Steven C. Medbery, Manager
Environmental Regulation
and Management

Date: February 7, 2005

## Part I - WASTEWATER EFFLUENT LIMITATIONS AND PROHIBITIONS

A. During the period of February 7, 2005 to February 6, 2010, the permittee is authorized to discharge all wastewater through the approved side sewer(s) from the facility.

B. During the effective period of this permit, any sample representative of the permittee's **wastewater discharges to the side sewer(s)** shall not at any time exceed the following numerical limitations, which are contained in Section 123 of Article 4.1:

1. Based upon any grab sample[1] of the permittee's wastewater:

| Pollutant parameter | Limit |
|---|---|
| pH | 6.0 min.; 9.5 max. |
| Dissolved Sulfides | 0.5 mg/L |
| Temperature (except where higher temperatures are required by law) | 125°F (52°C) |
| Hydrocarbon Oil and Grease | 100 mg/L |

2. Based upon grab samples of the permittee's wastewater, flow-weighted over a production week[2]:

| Pollutant parameter | Limit |
|---|---|
| Total Recoverable Oil and Grease | 300 mg/L |

C. During the effective period of this permit, any sample representative of the permittee's **wastewater discharges to the side sewer(s)** shall not exceed the following numerical limits, which are contained in the City's Department of Public Works (DPW) Order No. 158170 (1991), which is incorporated by reference in this permit:

1. Based upon 24-hour composite sampling[3]:

---

[1] *A "grab sample" means an individual sample of wastewater collected over a period of time not exceeding 15 minutes, as defined in federal regulations at 40 CFR Part 403.7(d)(2)(iv)(1990).*

[2] *A "production week" means the typical number of days in a calendar week when wastewater is discharged from routine operation and/or cleanup of the permittee's facility.*

## FINAL REPORT ON LOCAL/GENERAL DISCHARGE LIMITATION DEVELOPMENT

| Pollutant/Pollutant Parameter | Limit (mg/1) |
|---|---|
| Arsenic ( as Total) | 4.0 |
| Cadmium (as Total) | 0.5 |
| Chromium (as Total) | 5.0 |
| Copper (as Total) | 4.0 |
| Lead (as Total) | 1.5 |
| Mercury (as Total) | 0.05 |
| Nickel (as Total) | 2.0 |
| Silver (as Total) | 0.6 |
| Zinc (as Total) | 7.0 |
| Phenols | 23.0 |
| Cyanide (as Total) | 1.0 |
| pH | 6.0 min;9.5 max |
| Dissolved sulfides | 0.5 mg/1 |
| Temperature | 125' F (52' C) |
| Hydrocarbon oil and grease | 100 mg/1 |
| Total recoverable oil and grease | 300 mg/1 |

# APPENDIX D

# Protocols for Archaeological Artifacts

# PROTOCOLS FOR CONTAMINATED ARCHAEOLOGICAL ARTIFACTS ON PRESIDIO PARK LANDS

Prepared for

MACTEC Engineering and Consulting, Inc.
5341 Old Redwood Highway, Suite 300
Petaluma, CA 94954

and

The Presidio Trust
1750 Lincoln Boulevard
PO Box 29052
San Francisco, CA 94129

Adrian Praetzellis, Ph.D.
Registered Professional Archaeologist 10336

Anthropological Studies Center
Sonoma State University
Rohnert Park, CA 94928

3 October 2005

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2.0 Artifact Collection and Retention Policies ..... 1
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3.0 Artifact Handling, Processing, and Curation Procedures ..... 2
3.1 Artifact Material Types ..... 2
3.2 Handling Artifacts during Fieldwork, Processing, and Curation ..... 2
3.2.1 Decontamination in the field ..... 3
3.2.2 Removing surface dirt ..... 3
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3. Handling Requirements for Archaeological Material by Work Phase ..... 7

# PROTOCOLS FOR CONTAMINATED ARCHAEOLOGICAL ARTIFACTS ON PRESIDIO PARK LANDS

## 1.0 PURPOSE

This document provides guidance to archaeologists on Presidio park lands who may encounter artifacts contaminated with metals (e.g., lead) and organic contaminants (e.g., TPH, PCBs, and PAHs). Its purpose is to assist archaeologists in the safe handling, processing, and curation of these remains.

These protocols must be used in concert with professionally prepared health and safety plans (HASPs) for both field and lab work. It is essential that field archaeologists read and comply with the HASP for their work site.

These protocols, together with the HASP, will help the archaeologist:

- assess which artifacts should be collected and which recorded then discarded in the field
- safely handle and package artifacts to be returned to the lab
- safely process and store artifacts.

## 2.0 ARTIFACT COLLECTION AND RETENTION POLICIES

The protocols for ITC's archaeological program (ITC 1996) contain guidance for archaeologists monitoring earth-moving in the Presidio and the treatment of artifacts that result from these activities. This document requires collecting a representative "sample" of monitoring finds and retaining all materials from archaeological contexts that are deemed eligible to the National Register of Historic Places. The procedures include the following statements:

- When a discovery is made in the course of monitoring an excavation and the discovery consists of individual artifacts or artifact scatters that lack a meaningful context... the cultural materials collected in such a situation will be packaged together in an archival-quality reclosable plastic bag and labeled under this general provenience.
- Materials not intended for permanent curation... (i.e., pieces of modern trash) will be quantified, briefly described, then discarded.
- Cultural materials that are found to be contaminated that are non-porous will be decontaminated to the levels considered safe [for handling and storage].
- Cultural materials found to be contaminated but which cannot be decontaminated to levels considered safe due to their porosity, will be packaged and labeled with appropriate warnings. (ITC 1996:9.3)

### 2.1 Deciding to Retain or Discard Artifacts

ITC's protocols assume that all potentially important materials can and should be retained. As a practical matter, the expense and hazards associated with curating a large number of contaminated artifacts or a single highly contaminated object may be disproportional to the items' long research or interpretive value as defined in the project research design. While some items may retain a level of residual contamination that would justify their discard once adequately documented in the lab, others can be simply recorded in the field. This decision is at the discretion of the appropriate Presidio park archaeologist.

When artifacts are discovered, the archaeologist (and, where appropriate, the archaeological collections specialist) shall

- apply the decision tree (Figure 1), which specifies the conditions under which archaeological artifacts will be retained by field personnel and passed on to the archaeological laboratory for treatment;
- handle, package, and store artifacts according to the procedures outlined in this document.

## 3.0 ARTIFACT HANDLING, PROCESSING, AND CURATION PROCEDURES

This section guides archaeological personnel in their handling of artifacts at each phase of work: discovery, processing, and storage/curation.

### 3.1 Artifact Material Types

Figure 2 lists the types of materials that can be anticipated on Presidio archaeological sites. Artifacts made of these substances may have come into contact with hazardous materials and become contaminated. The extent of this contamination depends, among other factors, on the porosity of the material of which the artifacts are made. These material types vary greatly in their relative porosity. While the contamination of a non-porous artifact may be limited to the object's surface and removed with relative ease, a porous artifact may retain residual contamination within its interstices. Consequently, the safe handling and treatment of contaminated objects is, in many cases, contingent on their porosity as well as on the contaminant type (i.e., metals contamination is less likely to result in residual contamination post-cleaning as compared to organic contamination).

### 3.2 Handling Artifacts during Fieldwork, Processing, and Curation

Figure 3 describes the manner in which materials of various porosities are to be handled in the field and lab during processing and curation. While these procedures are intended to minimize harm to workers, the artifacts themselves may suffer if the procedures are not thoughtfully applied. In most cases, standard professional archaeological and conservation practices can be applied. The following guidance addresses special problems that may arise from the particular requirements of the HASP or the handling procedures presented in this document.

### 3.2.1 Decontamination in the field

Contaminated artifacts must be decontaminated before they are forwarded to the lab. An exception may be made for material of intrinsic value whose treatment requires procedures that can only be carried out in the lab. In this case, the materials must be packaged appropriately and clearly labeled with the type of suspected contaminant. All artifacts suspected of being contaminated must be packaged to confine the contaminant before they enter the lab.

### 3.2.2 Removing surface dirt

As sediments may contain contaminants, it is important to remove excess surface dirt from artifacts in the field by

- brushing or scraping, as appropriate
- washing with plain water
- cleaning with a solution of Alconox or similar mild detergent, as appropriate

Cleaning with a detergent will, in many cases, decontaminate non-porous and some semi-porous artifacts and allow them to be handled using standard archaeological methods. It is important not to soak porous or semi-porous material or to remove surface treatments (such as decals) during washing or cleaning.

Plain water used to free artifacts of surface dirt may be reused by allowing sediments to accumulate in a series of settling tanks and recirculating the water by a pump. This process of extracting artifacts from their encasing matrix may create or release byproducts that may themselves contain contaminants. These byproducts include

- contaminated water used to clean artifacts
- sediments that accumulate in the settling tanks
- ferrous metal encrustations

These byproducts must be handled, stored, and disposed of according to the HASP and Presidio waste storage policies.

### 3.2.3 Devitrification

Glass hydrates as it is exposed to the air and eventually may devitrify, becoming crazed and flaky. The scale that is created in this process may be harmful and can enter the skin through contact. Glass that shows signs of devitrification—such as iridescence—should be handled with disposable gloves.

### 3.2.4 Water-saturated materials

Porous and semi-porous materials from waterlogged environments should not be dried in the field. Excess liquids that may contain contaminants should not be collected and must be handled in accordance with HASP procedures. However, the artifact's current humidity level should be maintained while it is transported to the lab. In the case of fresh water saturation, this may be achieved by adding de-ionized water.

### 3.2.5 Discarding artifacts in the field

In some cases, a field decision may be made to discard certain artifacts rather than decontaminating and returning them to the lab. In this case, the materials may be simply recorded appropriately and placed back into the excavation.

### 3.2.6 Lab processing

In most cases, artifacts will have been decontaminated in the field before entering the lab. If contaminated materials must be brought into the lab they must be separated from the remainder of the collection. The type of suspected contaminant must be clearly marked on the outside of the box or other container. These artifacts must be handled in accord with the HASP.

When it is necessary to clean and decontaminate artifacts in the lab, arrangements must be made to dispose of any contaminated byproducts before they are created. These byproducts must be handled, stored, and disposed of according to the HASP and Presidio waste storage and disposal policies. When the decision is made in the lab to discard contaminated artifacts, these items must also be disposed of according to Presidio waste storage and disposal policies.

Contaminated artifacts may only be submitted for curation in exceptional circumstances and with the permission of the Presidio archaeologist. In this case, the artifacts must be packaged to confine the contaminant and the type of contamination must be clearly marked on the outside of the box or container.

### 3.2.7 Curation

Federal curation standards at 36CFR79 require that archaeological remains be handled, stored, cleaned, and conserved in a manner that protects them from breakage and possible deterioration from adverse temperature and relative humidity, visible light, ultraviolet radiation, dust, soot, gases, mold, fungus, insects, rodents and general neglect, as well as preserving data that may be studied in future laboratory analyses.

In most cases, contaminated artifacts will have been treated in the field or lab. Thus, handling these materials after curation should not require special measures in addition to standard archaeological curation practices. Any contaminated artifacts must be handled in accord with the HASP.

## REFERENCES

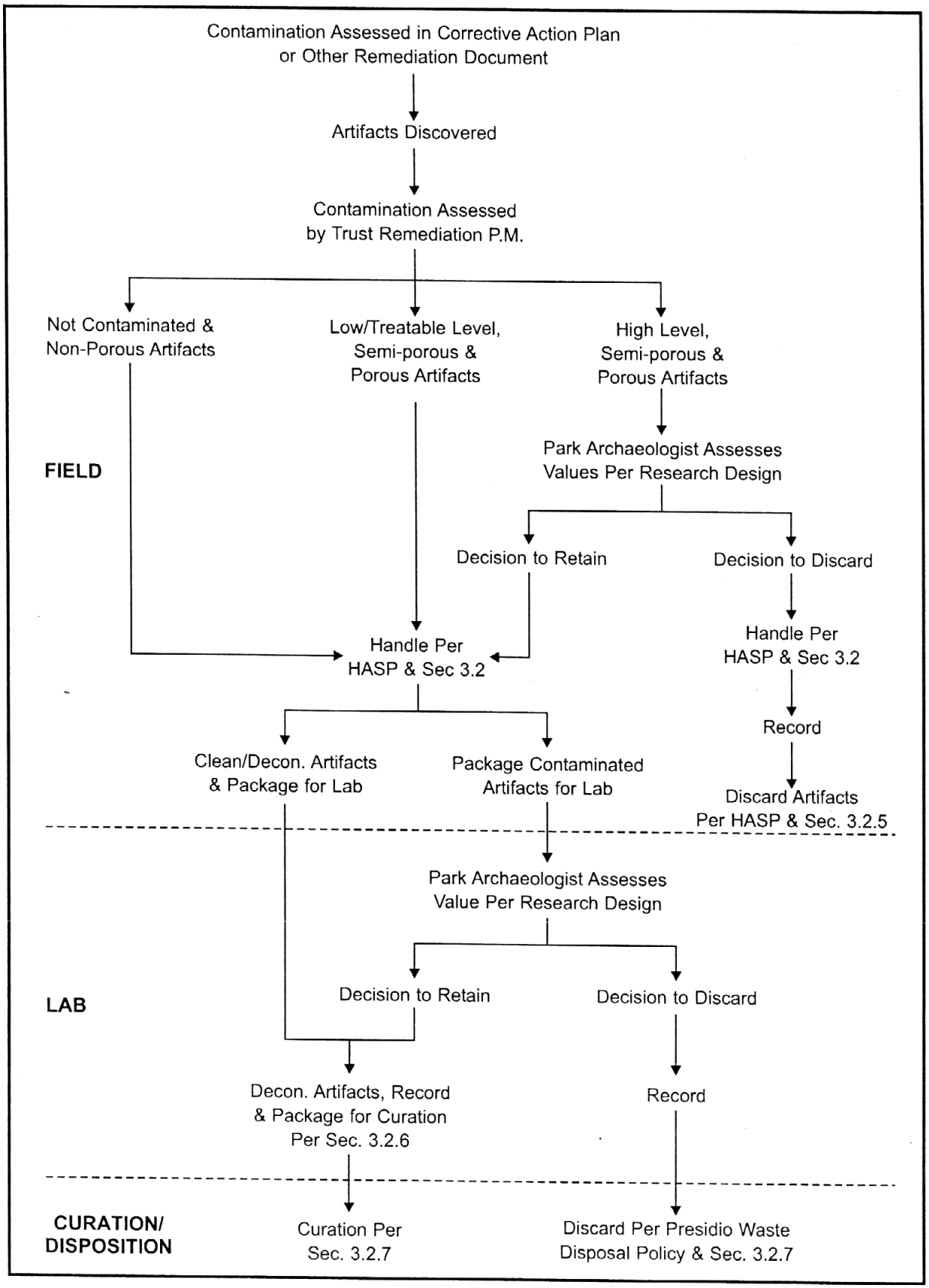

36 Code of Federal Regulations Part 79

*Curation of Federally Owned and Administered Archaeological Collections* (Authority: 16 US Code 470 et seq.)

International Technology Corporation (ITC)

1996 Archaeological Protocols, IT Archaeological Program, Presidio of San Francisco, San Francisco, California. IT Corporation, Martinez, CA, prepared for USA Corps of Engineers, Sacramento. CA.

**Figure 1. Decision Procedures for the Collection of Archaeological Artifacts**



## Figure 2. Relative Porosity of Archaeological Remains

| | RELATIVE POROSITY | | |
|---|---|---|---|
| | *Porous* | *Semi-porous* | *Non-porous* |
| *ORGANIC REMAINS* | | | |
| *Bone* | X | | |
| *Leather* | X | | |
| *Nut/seed* | X | | |
| *Textile/fabric* | X | | |
| *Wood/basketry/charcoal* | X | | |
| *Antler/horn* | | X | |
| *Ivory* | | X | |
| *Shell* | | X | |
| *INORGANIC REMAINS* | | | |
| *Earthenware* | X | | |
| *Brick (adobe)* | X | | |
| *Brick (low fired)* | | X | |
| *Brick (high fired)* | | | X |
| *Ferrous metals* | | | X |
| *Non-ferrous metals* | | | X |
| *Glass* | | | X |
| *Porcelain* | | | X |
| *Stone* | | | X |
| *Stoneware* | | | X |

## Figure 3. Handling Requirements for Archaeological Material by Work Phase

| | Discovery/Field | Processing/Lab | Curation |
|---|---|---|---|
| **Porous** (e.g., bone[1], fabric) | Handle in accordance with HASP procedures and section 3.2 above; remove excess soil; place in plastic or paper bag or other container to protect structural integrity; if potentially contaminated, label per section 3.2.1 above; transport to lab. | Determine if residual contamination exists; handle in well ventilated environment in accordance with HASP procedures and section 3.2.6 above; rinse with water if not too fragile or clean by hand; standard conservation methods may be applied to non-contaminated materials; dispose of contaminated byproducts appropriately. | Handle cleaned items in accordance with HASP procedures and section 3.2.7 above; most items may be curated in a collection facility that meets the standards at 36CFR79 although some may warrant special conservation and/or storage measures; some items may retain residual contamination that would justify their discard once adequately documented. |
| **Semi-porous** (e.g., shell, low-fired brick) | Handle in accordance with HASP procedures and section 3.2 above until cleaned with water, a mild detergent (e.g., Alconox, Simple Green, etc.), and a brush to decontaminate; place in plastic or paper bag; transport to lab. | Determine if residual contamination exists; handle cleaned items in accordance with HASP procedures and section 3.2.6 above; standard conservation methods may be applied to non-contaminated materials. | Handle cleaned items in accordance with HASP procedures and section 3.2.7 above; curate in a collection facility that meets the standards at 36CFR79. |
| **Non-porous** (e.g., porcelain, glass, stone, metal) | Handle in accordance with HASP procedures and section 3.2 above until cleaned with water, a mild detergent (e.g., Alconox, Simple Green, etc.), and a brush to decontaminate; place in plastic or paper bag; transport to lab. | Handle cleaned items in accordance with HASP procedures and section 3.2.6 above; standard conservation methods may be applied. | Handle cleaned items in accordance with HASP procedures and section 3.2.7 above; curate in a collection facility that meets the standards at 36CFR79. |

[1] The treatment of human remains is described in section 5.4 of ITC's *Archaeological Protocols*. Potentially contaminated human remains should be handled with disposable gloves. Contaminated or not, all human remains must be handled and stored respectfully while they remain under Presidio Trust control.